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TRAINING AND HORSE MANAGEMENT IN INDIA

TRAINING
AND
HORSE MANAGEMENT IN INDIA

WITH HINDUSTANEE VOCABULARY

BY

M. HORACE HAYES, F.R.C.V.S.

(LATE CAPTAIN "THE BUFFS")

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SEVENTH EDITION

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PREFACE TO THE SEVENTH EDITION

THIS valuable work by the late Captain M. H. Hayes has been carefully edited for re-issue in response to a demand from those in India interested in the *management and training of horses in that country.* It is hoped the work will continue to serve as a useful guide to horse lovers in the East.

M. SANDERS.

The Authors' Syndicate, Ltd.,
3-7 Southampton Street, Strand,
London, England.

June, 1929.

PREFACE TO THE SIXTH EDITION

THIS is the first book that my husband wrote and also the last; for he was correcting the final proofs of this edition when he was summoned to lay aside his pen and to pass from this toiling world in a peaceful sleep.

His brilliant works on horses are well known to the horse-loving public in all parts of the world, and that this volume has proved of immense value to horse-owners in India is testified by the fact of a sixth edition being required. Mr. Harry Abbott, the well-known writer and sportsman, wrote of it: "It is within a few months of thirty years since I first reviewed *Training and Horse Management in India*. At the time it was issued there was nothing in print to aid either professional or amateur trainers out here, so that the useful little booklet came as a boon and a blessing to them. During the whole of my long racing career in this country, that work, and its vastly improved subsequent editions, was my guide, philosopher, and friend, and I never found the sage advice it contained even doubtful; on all sides it earned and merited unstinted praise. I can safely say that I chiefly owe my many successes on the Indian turf to carefully following its sound precepts."

I feel that all horse loving sojourners in the East will share my sorrow that such a valuable life has ended.

ALICE HAYES.

Yew Tree House, Crick, Rugby,
May, 1905.

PREFACE TO THE FIFTH EDITION

I HAVE carefully revised the present edition and have made several additions and corrections, which were suggested by the experience I had gained during three years' training and horse dealing in Calcutta, and four years' travelling through Egypt, India, Ceylon, China, South Africa and other countries on horse-breaking expeditions, since the previous edition had appeared. The racing records, weights for age and class, etc., have been brought up to date as far as possible.

Junior Army and Navy Club,
St. James' Street, S.W.
October 1, 1892.

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PART I

HORSE MANAGEMENT

CHAPTER I

STABLES

Position and construction of stables—Picketing horses—Poultry near stables—Disinfecting stables.

POSITION AND CONSTRUCTION OF STABLES.—In considering the subject of stable construction in India it is important to bear in mind that horses thrive much better in temperate climates than in hot ones, and that the moister a hot climate is, the less favourable will it be for the production or maintenance of horses. For instance, in the hot, damp climate of Lower Bengal the breeding of useful horses is practically an impossibility.* Consequently, we should try to counteract, as far as possible, the bad effects of these two factors (heat and moisture). The baneful results of atmospheric moisture in hot countries are due to the fact that evaporation from the skin, which is the great natural means of keeping the body cool during hot weather, is checked in proportion to the amount of moisture present in the air. Thus, in the hot damp climate of Singapore, for example, the human skin remains in a more or less moist condition, with frequently a drop of perspiration hanging from the end of the nose. But during the far hotter weather of the dry Punjab, the skin is usually as free from moisture as the proverbial bone. On the other hand, this evaporation is stimulated by the surrounding air being in movement, as we feel when under the punkah. Experience tells us that the higher the ground on which a stable stands, the freer, as a rule, will be the circulation of the air in its vicinity. The hotter air is, the greater is its power of absorbing moisture. We have also to guard against the dangerous effects of the direct rays of the sun, which are best opposed by the interposition of a bad conductor of heat.

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* The effects of climate and soil on equine conformation is a subject which has been discussed at considerable length in chapter xxvi of the last edition of *Points of the Horse* by the same author.

In the plains, stables should, as a rule, be built on high ground, devoid of objects in their immediate vicinity which might impede cooling breezes. Their direction should run at right angles to the prevailing winds, so as to obtain free circulation of air through the building; for, in India, our efforts should be directed in providing against the baneful effects of heat, rather than against those of cold, which can nearly always be obviated by warm clothing. In all hot countries experience proves that the chief requisites for good stables are airy and dry positions, thick roofs overhead, lofty and spacious stalls, and perfect circulation of air. As long as men or animals are protected from the direct rays of the sun, while the air blows freely through the habitation, whatever it may be, there is little danger from the effects of the tropical sun. The best proof of this important principle is afforded by the fact that, however powerful the noonday sun may be, and however fiercely the hot wind may blow, neither man nor beast will suffer much from the high temperature when out in the open, if they be under the shade of a tree with thick foliage. But if, on the contrary, the current of air be impeded by a wall, screen, or other object, the distressing effects of the heat will be felt in a moment. Stagnation of air, in most cases, is the cause of the many instances of fever which occurs among horses during the hot weather, especially in large cities like Calcutta, where houses are crowded together. I have seen on different occasions horses, that were almost dying from the effects of heat in stables situated on low and confined positions, recover their condition and health in a very few days after being removed to others on high and airy ground.

I have tried the experiment of keeping a race-horse in my own house during the hot weather; but he suffered far more, even under a punkah, from the confined atmosphere inside than he had done in his stable, which was many degrees hotter, but which had a free current of air through it.

If valuable horses be kept during the hot months in the plains, punkahs may be used with advantage. If they cannot be conveniently fixed, and the horses feel the heat much, a couple of coolies may be told off to each animal, to keep him cool during the midday heat with a large hand-punkah.

I have always found that, when proper precautions have been adopted, horses in dry climates, such as those of the North-West, Oudh, and the Punjab, have retained their health and condition during the hot weather quite as well as they did during the cold months.

In order that the stable should be kept as dry as possible, its walls should be constructed of some material which will not absorb moisture, such as fire-burnt bricks or stone, the former being, I think, the better material. Wood may also be employed, though stables made of it are not nearly so cool during the hot weather as those constructed of either of the other two. Throughout Eastern Bengal the walls are made of strong bamboo screens, which serve their purpose admirably. In such a stall a kicker may be saved from injuring himself by placing matting (Hind. *chitai*), say, 3 ft. high, about 6 in. from the wall, while the interval may be filled up with dry grass, which will give to the blow and act as a padding to the wall.

The floors of the stable should, if possible, be laid down with some material which will not absorb water. A good flooring for stables, whether in India, England, or elsewhere, is one of thick wooden planks, so arranged that the urine of the horse may drain through the interstices between them, on a waterproof surface. These planks may be about 9 in. broad and 3 in. thick, and should be placed so that they can be readily removed, and the under floor cleansed. I observed in the Durban Tramway Company's stables (Natal) a good arrangement, by which a waterproof drain—the width of which was equal to the length of each stall—of slightly curved shape ran underneath each long line of stalls, the planks which formed the flooring being made to fit accurately across it. When the horses were out at work, the planks could be readily removed, and the shallow drain washed out. To prevent the absorption of moisture by the wood, it could be tarred over or soaked with asphalte. The special advantage of wood for the flooring of a stable is that it is a bad conductor of heat, and would consequently act as a preventive of chill and cold. Wood is often employed as a flooring of stables in the Straits Settlements and Far East.

In many parts of India *kunkur* may be obtained, and can be applied in the same manner as it is used for metalling roads. In default of it, pounded bricks, which are employed for the same purpose, may be substituted. After these floors are laid down, the stables should not be used until they are thoroughly dry, and the concrete has become hard and solid. Horses stabled in stalls laid down with concrete are, during the prevalence of Loodianah fever and influenza, much less liable to be attacked by these diseases than they would be if the floors of their stalls were capable of retaining moisture.

If it be not practicable to have the floors made of waterproof material, they may be kept covered with 5 or 6 inches of sand, the tainted parts of which should be daily removed, and replaced by a fresh supply.

Damp stables are the sources of many serious ailments to the horse, who can keep health and condition only in a dry habitation. This most important fact should never be lost sight of by the horse owner.

The floor of the stable should be made level, so that the horse may have an even " bearing " for his feet. The syce should keep the stall dry and clean, without any provision for the drainage of urine being required. This form of construction is in accordance with the practice followed in all the best racing stables at Newmarket, where it has been found unnecessary to drain the stalls and boxes by giving a slope to their floors. The ground around stables, however, should be thoroughly well drained.

A good form of stables is a single row of boxes having a veranda about 12 ft. wide, on the outer line of which the roof is supported by a row of pillars, which are the same distance apart, one from another, as are the partition walls of the stalls. The verand should be protected by bamboo frames covered with thatch (Hind. *jhamp*), so that in the hot weather the direct rays of the sun may not play on the interior of the building, and in the cold months the horses may be protected from draughts.

Loose boxes, to be thoroughly comfortable, should be at least 12 ft. by 16 ft. In India, 10 ft. by 12 ft. would be a minimum. The walls between the boxes should be made about 7 ft. high, so as to be just sufficient to prevent the animals smelling each other over them. *Stalls* for large horses should be 6 ft. by 12 ft. Ponies may be contented with one of 5 ft. by 10 ft. At Newmarket, stalls are generally made 6½ ft. wide. If narrow stalls are used, the syce, when removing a horse, should back him out, instead of turning him round, so as to prevent him from straining his back or loins.

If not more than five or six horses are kept in one stable, they will be able to get better rest than if more animals be present.

The roof of the stable should afford perfect protection from the direct rays of the sun; for which object thatch will be found to be the best material. Flat masonry roofs may be protected by having earthen vessels (Hind. *gurra*), filled with water, placed on them; while tiled roofs may be covered by *jhamps*. If expense is no object, double roofs may be employed with great advantage. The stable may be admirably ventilated by a space of a few inches being allowed, all round, between the roof and the top of the outside walls.

At the head of each box or stall there should be a window, say, a yard square and a yard and a half above the ground. The space below the window may be occupied by a movable door, which, during the hot hours, may be taken away, and a thin bamboo screen hung across the opening. If the stable is built of brick, additional ventilation may be obtained by having alternate bricks removed from the first two or three bottom rows of the wall, at the head of the stall, for a distance of 6 or 7 ft. These holes may be stopped up in cold weather. If possible, there should always be a space of a few inches all round, between the roof and the top of the outside walls.

The outside of the stable should be whitewashed, so as to prevent the absorption of heat; and the walls inside should be dark coloured.

When flies are troublesome, *surkunda* (a cane-like grass) or split bamboo screens should be placed in front of the doorways and windows, and should be kept down from sunrise to sunset. The cleaner and darker stables are kept, the freer will they be from flies

In many stables in India, covered receptacles for urine, which the syces are supposed to bale out every day, are made in the centre of the stalls. This is, obviously, a most objectionable arrangement. Another common trick of these servants is to teach their horses to stale into an earthen pot, which they hold for them, and thus get rid of the fluid without it soiling the bedding. This is, in my opinion, a very bad practice; for horses that are accustomed to it will often, if the syce be not ready to hold the vessel, abstain from staling for a long time, and will thereby be rendered uncomfortable. The litter should be taken up twice a day; every soiled particle of it should be removed, and the floor should be thoroughly cleaned and dried. The less tainted portions of the bedding may be dried in the sun for further use.

The doorways of the stalls are usually barred across by two poles—generally bamboos—which are let into the walls at each side, the upper one being fixed about 4 ft. from the ground. These bars are sometimes made to slide through boarded passages in the walls, an arrangement that will save the latter from becoming broken. The best and neatest plan is, I think, to plant two strong upright posts—in which are bored holes for the reception of the horizontal poles—10 or 11 in. from each side of the walls at the doorway. The walls will then be free from injury, and there will be no occasion to remove the bars, except when the horse is taken out or in, for there will be quite sufficient room for a man to pass sideways between the walls and the upright posts. The bars are secured by being lashed together with a piece of rope.

Movable half-doors—as well as bars—may be provided, to be used when the nights are cold.

As a rule, hard-worked horses rest and thrive better in boxes than in stalls. Some animals, however, when kept apart from their fellows, pine from want of companionship; and others, if allowed to be loose, incessantly wander about their box, and, consequently, unduly fatigue themselves. Perhaps, in the majority of cases in England, mares do best in stalls, and horses in boxes. In India, however, it is not always practicable to keep animals out-of-doors as long as would be desirable, with regard to their health, were the climate less "trying"; hence the greater need for boxes in our Eastern Empire than in more temperate climates.

The veins in the foot of the horse, unlike those in other parts of the body, possess no valves. Stagnation of blood by gravitation, however, is prevented by the practically constant movement which the horse makes in the search for food while in a natural state. When the foot is raised an increased flow of blood courses through these vessels, which at the next moment become relatively emptied by the effect of pressure when the foot is brought to the ground and weight is thrown on it.

I agree with Admiral Rous's remark, that "The windows of a stable ought never to be shut by night or day; in cold weather, add to the clothing of the horses, but never deprive them of the first great source of vitality, 'fresh air.'"

In India, during the cold weather, the air is generally so dry that precautions to be taken against draughts are not nearly so necessary as in England. Respecting the latter country, Professor Williams writes, "Horses kept in ill-ventilated stables are undoubtedly rendered susceptible to many diseases, and to pneumonia among the rest, but they will bear impure air even better than cold draughts blowing directly upon them. I have repeatedly observed that the slightest cold contracted by a horse kept in a draughty stable has almost invariably been succeeded by pneumonia, and that, if the animal was not removed to a more comfortable situation, the disease tended to a fatal termination."

Many grooms in England have a strong prejudice in favour of warm stables, on account of the good effect they have on the animals' coats. These men ignore the increased susceptibility to catching cold which horses kept in such places acquire, as well as the very marked tendency the legs and feet have to "go to pieces"; for a horse that is laid up with a cough or a filled leg, gives less trouble to the groom than one which is in full work. In winter, horses undoubtedly thrive better in comfortable stables than in cold, bleak ones. The owner, trainer, or groom can personally satisfy himself as to the proper degree of warmth, by regulating it according to what he would consider agreeable to his own feelings were he to make the stable his own abode, always remembering that its atmosphere should be pure, and free from the slightest suspicion of " closeness."

With hard-worked animals, such as racehorses, I have found the best results attend the practice of keeping the stables moderately dark, in order to induce the occupants to lie down, and, during hot weather, to keep the abode cool by preventing the admission of rays of light, which are always accompanied by rays of heat. I here take for granted that the free circulation of air is not interfered with.

In the cold weather, if horses be not worked to an extent that would render it desirable for them to repose during the day, and especially if they be not kept for a considerable time in the open air, their stables should not be darkened; for the rays of the sun, when not too powerful, have a beneficial effect on the general health of animals by improving the quality of their blood.

On all occasions when the stables are empty they should be thrown open for the admittance of sunlight, which is a powerful disinfectant.

PICKETING HORSES.—Head- and heel-ropes are admissible only with animals—like those in the Artillery and Cavalry—that may be called upon to camp out at any time. In such cases, if there be any probability of rain, great care should be taken to render the pegs secure; for if a shower falls, it will make the horses fidgety, and will loosen the hold the pegs have in the ground.

Natives, when they use head- and heel-ropes, are very prone to tie up the horses far too tightly.

Horses should not be picketed by a fore-leg; for then they will be very apt to "screw" themselves by straining at the rope, in the event of being startled, or when jumping about in play.

During the hot weather in the plains, the horse may with advantage be picketed at night to a pole fixed vertically in the ground, round which his bedding should be spread. The head-rope should be attached to a movable iron ring, which works round the pole. No heel-ropes are then necessary.

In hot, close weather when there is no wind blowing it is often better to picket a horse in the open, during the midday heat, under a tree which has thick foliage overhead, than to keep him in the stable, however well ventilated it may be. The leaves of trees exercise a marked cooling effect on the air that passes over their surface; hence we speak of "the grateful shade."

Poultry should never be allowed about a stable, nor should they be kept near it; for the insects that often infest fowls prove excessively irritating to the horse when they are allowed to settle on him. Removal of the poultry will soon cure the animal attacked, for these parasites cannot live beyond two or three days away from their proper "host."

Disinfecting Stables.—When the floors of stables are formed simply by the surface of the ground, they should be dug up from time to time—say, once every two months to the depth of a couple of feet, the tainted soil removed, and fresh, dry mould substituted. This proceeding is particularly necessary after the appearance of Loodianah fever.

To purify metalled floors and drains, a solution of 1 lb. of sulphate of iron (Hind. *burre kussees*) to the gallon of water may be used.

Crude carbolic acid, suitably diluted, may be applied to the iron and woodwork of the stable.

Carbolised sawdust may be sprinkled here and there in the stable occasionally, in order to keep it fresh and sweet. This preparation is made by steeping sawdust in as much crude carbolic acid and water—using a solution of equal quantities—as it will take up.

CHAPTER II

CLOTHING—BEDDING—STABLE GEAR

Clothing — Bandages — Boots — Cloths — Bedding — Mangers —Feedingsheets—Nosebags—Fomenting buckets and shoes—Oat-bruising machine—Articles used in grooming.

Clothing.—For the maintenance of high conditions in the horse, it is requisite that he should be supplied in the stable with an ample quantity of warm clothing —short of causing him to perspire. Clothing not alone stimulates the skin, and guards the animal from the ill effects of chill, but also aids in maintaining the internal temperature of the body, thereby supplementing one of the most important offices of food. To avoid overweighting the horse too much, it is advisable to use only English clothing of close material, and not too heavy. During the cold months a suit of warm clothing by day, with an extra rug at night, will generally be sufficient. As a rule, hoods may be dispensed with, although, if the animal is suffering from a cough or cold, a "night-cap" may be put on at night. This article is a short hood about a foot long, and is made to fit close round the throat. Ordinary hoods, if buckled to the body-piece, are apt during the night to prove uncomfortable to the horse. It unattached, they usually fall over the animal's head on his lowering his neck. The head-collar should be put on over, not under, the hood or "night-cap."

Horses that are used for rough work in all weathers should naturally be lightly clothed, so that they may not be liable to be affected by change of temperature. On this point, the owner should exercise his own judgment.

Clothing, with the breast and quarter-piece in one, will do for night use, but if it be worn by horses when they are exercised, it will cause the hair to be rubbed off their shoulders, thus giving them the appearance of having been in harness. If hoods be made of country blanketing they should be lined with cotton cloth, so as to save the manes from being injured by the coarse woollen material.

A suit of warm clothing can be made from an English pattern at a small cost.

The use of warm clothing often irritates a horse which has a thin delicate skin. In such a case a light cotton sheet should be placed under the woollen suit.

With well-bred horses rollers should be furnished, with breast-plates, to prevent them from working back.

BANDAGES.—Horses that have done much work, and whose legs are inclined to fill, will generally require the aid of flannel bandages to keep their limbs fine. The uses of these bandages are to encourage insensible perspiration from the skin, to afford support to the tendons and ligaments, and, by pressure, to cause absorption. They should be made of close, thick flannel, similar to that used for cricketing trousers. Serge should not be employed, as its texture is too harsh. They should be about 8 ft. long and 4½ in. broad. "Bandages, specially made, with a selvedge on each side, can be obtained from any saddler. They are, however, often too short, too thin, and too wide. A bandage to be ready for immediate use should be wound up with tapes inside. When about to put it on, unroll 6 or 8 inches of it, and lay this loose portion obliquely across the outside of the leg, close to the knee, with the end reaching to about the centre of that joint, and the rolled-up part turned to the outside, and directed downwards and forwards. The bandaging should be continued down to, and around the fetlock and upper part of the pastern, and brought close up below the knee. The loose end is then turned down, and the folds of the bandage carried over it. The tapes are tied a little above the centre of the cannon bone. By this method no twists need be taken in the bandage, which will lie close." *

When flannel bandages are used to give support during work, they should not be broader than 3½ in. In the book from which I have just quoted I have given a drawing to show their mode of adjustment. Commence by laying the loose end diagonally across the fetlock, with its extremity a little below that joint; then take about four turns round the leg, so that the bandage may come close below the knee,

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* *Veterinary Notes for Horse-Owners*, by the same author.

take another turn in a downward direction, bring the loose end up and lay it flat against the bandaged part, and continue the turns over it. The loose end will now be firmly secured between the cloth on both sides. When put on according to this plan, the bandage cannot become undone unless the tape breaks.

A good bandage for giving support is an elastic one, made from the material used for side-spring boots, and of the same form as an ordinary bandage, but somewhat shorter, so as to allow of its stretching. These bandages will not bear being rolled round the fetlock and pastern, for, if this be done, they will work loose.

Cotton Wadding Bandages can be prepared and applied in the following manner: Take 2 yards of cotton wadding (which can be obtained from any draper) and cut it down the centre, so as to have two pieces of wadding, each 2 yards long and about 10 inches wide. In some shops cotton wadding is sold in short pieces instead of in long rolls, which is the more convenient form for the purpose under consideration. Wrap the leg round with the wadding, one piece over the other, in the way shown in Fig 1, and apply, rather loosely, a calico bandage (which can be got ready-made from any chemist or can be constructed out of a piece of unbleached calico) about 6 yards long and 3 inches wide, so as to keep the wadding in place, and put on tightly another and similar calico bandage, so as to afford firm and evenly distributed pressure on the leg, and secure it by tapes, sewing, or by a safety-pin. The wadding and bandages will then give the appearance shown in Fig. 2. With this amount of wadding, there is practically no danger of putting on the second bandage too tightly. I find that it is easier to distribute the pressure evenly with two bandages than with one. If cotton wadding cannot be obtained substitute ½ lb. of ordinary cotton-wool—the medicated kind will not do as well, because it has lost a large portion of its elasticity—and arrange it round the leg, or use some similar material, such as sponge, wool, or moss. I have sometimes found, when using cotton-wool for the purpose in question, that its presence next the skin gives rise to irritation, probably

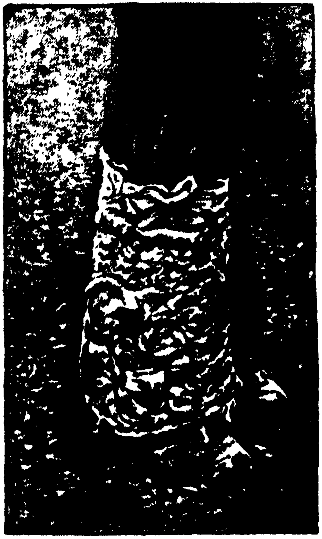
Fig. 1.

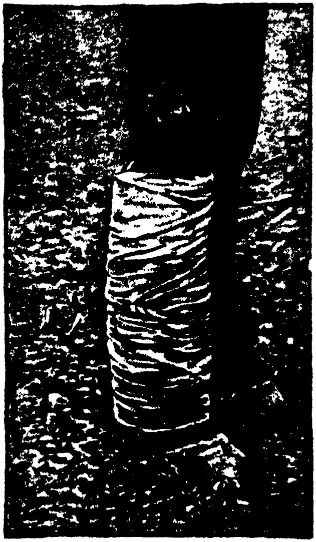
Fig. 2.

on account of the pressure not being evenly distributed. This untoward result can be obviated by—in the first instance—wrapping the leg loosely round with a piece of soft cotton cloth, or by putting on an ordinary flannel bandage and the cotton-wool over it.

Boots are worn to give support like bandages, and also to prevent the horse from hurting himself by "brushing", or by otherwise striking his leg. For the former object, the boot may be made of strong boot elastic, and to lace at the side. The laces may be made of whipcord, or, better still, of strong waxed hempen thread. For "brushing" or "speedy-cutting" leather guards should be sewn on to the inner side of the cloth. The same precaution may be used with cross-country horses to protect their back tendons, especially when schooling.

When putting on boots, care should be taken tha the upper and lower straps are buckled looser than the middle one, or pair, according as there are three or four of them.

Bandages are best for support, boots for protection.

Cloths are commonly employed in England instead of bandages; they are formed of stout "box cloth", sewn down the side of the horse's leg, and are not removed. I think bandages, which are properly put on, are decidedly superior to them in every way, especially in the facility they afford for hand-rubbing the legs (*p.* 110). Besides, irritating substances picked up from the ground are apt to get inside the cloth and hurt the leg. This is especially the case when animals are galloped on tan.

BEDDING.—Long, clean, wheaten straw furnishes the softest and most comfortable bedding for the horse, especially if he be without clothing. Oat straw is brittle, and therefore does not last as well as that obtained from wheat. Horses rarely eat rice straw, but it is not economical to use as it very quickly breaks up. With respect to horses eating their bedding, see page 60.

To prevent a horse from eating his bedding, the straw may be damped, and kept in the sun a few days before using, so that it may become too sapless and unpalatable to be chosen in preference to grass, while a layer of old bedding may be kept on the top. Such cases of morbid appetite will generally call for medical treatment, if a full supply of salt and green food, such as carrots, lucern, etc., fail to correct the habit.

Cheena straw makes excellent bedding, as it is soft, difficult to break, and unpalatable to most horses.

The bedding should be carefully spread to make it as comfortable as possible for the horse, and should be banked up around the walls, to prevent the animal hurting himself when lying down, or when rolling. At the entrance to the box or stall, for appearance's sake, the bedding should be arranged in a straight line, which may be finished off by a piece of plaited straw being stretched along it.

Hard-worked horses should, if possible, have the bedding under them by day as well as by night, so that they may have every inducement to lie down and rest themselves when they choose. Besides, when the horse stands on the bare ground, he will abstain from staling longer than he ought to do, and, maybe, to an injurious extent. Most of us old Indians know that a straw mat, expressively called in Hindustanee a *seetúl patee*, or cold mat, is the coolest thing on which to lie during the hot weather; so we may infer that straw forms an equally grateful couch for the horse. While he is out at morning and evening work, the bedding should be removed, and dry straw should be substituted for any that may have become soiled or wet.

A slight additional expense is the only objection to keeping the horse bedded down by day.

I have found that *sawdust* makes a good substitute for straw, though I am inclined to think it takes some of the polish off the coat. "Stonehenge" remarks "that it soon heats when wetted with urine, and ammonia is given off profusely, so that great care must be exercised to change it as soon as it becomes soiled."

When a horse has on a high-heeled shoe—as during treatment for sprain of the back tendons or suspensory ligaments, etc.—sawdust makes the best bedding, for it will not catch in the long calkins. Sawdust alone, without a raised shoe, enables a horse to assume a comfortable position for the injured limb.

Sand forms a very cool bedding for horses, who generally show by frequently rolling on it that they like having it under them. Its use spoils the look of the coat for the time being, on account of its absorbing a considerable part of the oil which is secreted by the glands of the skin, and serves to keep the hair soft and pliable. A serious objection to the use of sand as a bedding is that some horses have a tendency to eat it, especially if it is sea-sand. Its consumption causes colic, and sometimes death.

Tan is an excellent material to put down in a loose box for a horse that is at all inclined to inflammation in the feet, provided that the syce is careful to remove the wet portions immediately they become tainted. When tan is used as a bedding, the feet of the horse should be picked out at least four times a day, because the retention of tan in the feet readily causes thrush.

MANGERS.—Many years ago, Prof. Coleman directed, and with reason, that the feeding-trough should be placed on the ground, as that arrangement makes the horse assume the natural position in which he was intended to feed. I advocate this practice, because it obliges the animal to eat much slower than he would do were the manger in the usual position; hence he will masticate his food more thoroughly. To carry out this principle still further, I would advise the use of a broad feeding-box, in which the grain should be spread in a comparatively thin layer. Some horses, from infirmity, etc., will require the manger to be slightly raised, say a foot from the ground.

SHEETS may be used with advantage instead of mangers. They may be made of sacking (*tat*), and about a square yard in size. They are laid on the ground, and the grain is spread over them. They cost little, are easily cleaned, and can be packed up in a small compass. I have always employed them with my own horses in India.

Nosebags.—These articles should never be used, except when a proper manger is not obtainable, as on the march, etc.; because they are uncomfortable to the horse, who, with one on, is apt to bolt his food or chuck it out; and he cannot help tainting his corn with his breath and rejected saliva. Besides, it is difficult to keep nosebags clean and sweet. If used, they should be made of canvas or sacking, and not of leather; should be deep, not too wide, and should narrow off to the bottom, so as to allow the animal, towards the end of his feed, to pick up readily the remaining grains of corn without having to chuck the bag up.

A common plan for preventing a horse from throwing corn out of his nosebag is to tie a string at the place where each end of the head-strap is fixed to the bag, and then attach it just above one of the animal's knees, at such a length that he cannot throw up his head.

When nosebags are employed, horses should have something on which to rest them, for instance, a low wall, or a bundle of hay. Dray horses may often be seen supporting their bags on their companions' quarters. Without such aids the animal will be liable to spill his corn in his attempts to get it into his mouth.

Fomenting Buckets and Shoes.—A couple of long, narrow leather buckets for applying warm water to horses' legs are useful in cases of accident. They should reach up to the knee, should be made of stout hide, and should be provided with wooden bottoms to preserve them from injury. Water at a temperature higher than that which the hand can comfortably bear should never be used in fomenting the horse's skin. A pair of shoes, with wooden bottoms, made of pliable leather, and reaching only to a little above the fetlock joint, can be kept for poulticing the feet, when required. Each shoe should be provided with a leather thong to close the mouth round the leg. Mashed turnips or carrots form an excellent poultice.

OAT-BRUISING MACHINE.—Machines which are provided with circular rollers should be employed for oats.

ARTICLES USED IN GROOMING.—Each horse should be provided with a brush and curry-comb, a hoof-picker, mane-comb, three or four cotton rubbers, and a couple of wisps made of unprepared hemp. One pair of scrapers will be enough for a small stable.

English *body-brushes* should be used in preference to those of country make. The bristles should be closely set, long, and moderately soft, so as not to hurt the skin while cleansing it from scurf. Each rib of a *curry-comb* should be made of wrought iron, and should be riveted at each end to the iron back. The teeth should be blunt, so that they may not unduly wear out the bristles of the brush. An inferior kind has the ribs made in pairs from pieces of sheet iron turned up at the sides. These ribs quickly lose their shape, and, owing to the thinness of the metal, their teeth are much too sharp. Long, thin, copper *sweat-scrapers*, made with handles at each end, are preferable to those of a semi-circular form, constructed with only one handle, as the latter are hard and unyielding to the skin.

Capital *wisps* may be made from unprepared hemp (Hind. *sun*).

CHAPTER III

VARIETIES OF FOOD

Oats — Gruel — Gram — Kúlthee — Úrud — Moong — Mote —Barley—Indian corn—Wheat—Cakes—Bran—Linseed —Rice—Suttoo—Goor—Carrots and other roots—Grass and hay—Straw and chaff—Oat hay and wheat hay—Kurbee —Bamboo leaves—Lucern—Milk—Stowage of grain.

OATS.—This grain, when grown in India, possesses a far larger portion of husk to flour than that produced in England; hence its lower value as an article of food. As the measure of the horse's appetite is by bulk rather than by weight, the heavier the oat, the more valuable as a rule, does it become. Samples at 47 lbs., 42 lbs., and 32 lbs. to the bushel will respectively yield about three-fourths, one-half, and one-third flour, which proportions approximately give the nutritive values. Mr. Stewart (*Stable Economy*) tersely describes sound English corn as follows: "*Good oats* are about one year old, plump, short, hard, rattling when poured into the manger, sweet, clean, free from chaff and dust, and weighing about 40 lbs. per bushel." Although our Indian oats are far below this standard, still they are much superior, as a food for horses, to any other grain which we can procure in India. This is especially so in the case of hard-worked animals, because they can eat an almost unlimited quantity of oats without it disagreeing with them. On the contrary, gram and *kúlthee*, given in amounts sufficient to supply the necessary nutriment, nearly always upset the digestion, and induce a " heated " state of the system.

In order to make up for the inferior quality of the oats, we may, with great advantage, supplement them by an addition of gram or *kúlthee*, which should not exceed a third of the whole amount. This practice is similar to that adopted in England of adding beans to the corn, and is particularly applicable to old horses whose powers of assimilation are impaired. In England, new oats are rightly considered to be indigestible —an objection which may be removed by having them *kiln-dried*; but in India they not do appear to be injurious to any great extent—a fact which may be accounted for by the extreme heat of the tropical sun. New Indian oats never present the soft pulpy appearance seen in new English oats.

Oats should be given in a bruised state, for then the animal is obliged to chew it more thoroughly than if it were given whole, and the possibility of the grain passing through the horse in an undigested condition is avoided.

On the Bengal side, oats are principally grown in Tirhoot, Dehra Doon, and the Meerut district.

Gruel is best made by well mixing a pound of oatmeal with a quart of cold water, to which should be added three quarts of boiling water; the whole being put to simmer over the fire and occasionally stirred up until it thickens. It should then be removed and allowed to cool. It should be given to the horse in a lukewarm state, and of a consistency a little greater than that of milk. It may be flavoured with a little salt, or sugar may be added to it, according to the horse's taste.

Although gruel is generally regarded as a good "pick-me-up" for exhausted horses, it possesses comparatively little merit in that respect, because the contained grain, after entering into the stomach, cannot be properly digested unless it is well mixed with saliva. As the secretion of saliva into the mouth is largely dependent on mastication, the more fluid a food is, the less saliva will accompany it into the stomach and intestines.

SUGAR, especially cane sugar, is the best of all restoratives for animals in a state of exhaustion, because it can be absorbed into the system with little or no preliminary preparation by the digestive juices. Also, the more tired a horse is, the more torpid are his digestive organs. Therefore a solution of sugar is a far better restorative to a fatigued horse, supposing that the amount of sugar is equal to that of the starch in the gruel. Two or three pounds of cane sugar dissolved in, say, half a bucket of cold water, is a much more refreshing drink for a tired or weak horse than a similar quantity of gruel.

GRAM (*Cicer arietinum*).—This grain, known as *chunna*, is very commonly used throughout Northern India and the Bombay Presidency. It is objectionable on account of its tendency to cause diarrhœa, and to induce a "foul" and "heated" state of the system, when given in large amounts, say anything above 10 lbs. daily. It is best used in combination with bran, oats, Indian corn, barley, or rice in husk. Before being used, it should be at least seven or eight months old, and should be given in a broken state, and always *dry*. The practice of steeping gram in water is injurious.

KÚLTHEE (*Dolichos biflorus*) is extensively employed throughout Madras and Bombay. It seems superior, as a food for horses, to *chunna*, when either grain is used alone, and, in limited quantities, has an excellent effect on the general condition and coat. On account of the hardness of the husk, it has to be given in a boiled state. Only just enough water to cook it should be used, so that, when fully done, the fluid which remains over in the pot may be absorbed on cooling. The steam should be allowed to escape, so that the *kúlthee* may become as dry as possible. When properly boiled, the interior of the grains should be dry and floury, like that of good and well-cooked potatoes. *Kúlthee* is very similar in its composition to gram, and may be used in the same combinations with oats, etc.

In the Bengal Presidency it is readily procurable at Hajeepore, which is near Patna, and also at different places in the North-West Provinces. *Kúlthee* which is grown in those parts does not appear to be as good as that produced in Madras.

ÚRUD.—This variety of *dal* is a food common among natives in Eastern Bengal, and more or less so in other parts of India. It is extremely like *kúlthee* in composition and qualities, and is prepared in a similar manner.

Both *kúlthee* and *úrud* are valuable when a change of food is necessary, especially when the animal is in poor condition, and his skin out of order.

Moong (*Phaseolus radiatus*), boiled, and given like *kúlthee*, may be used with advantage when a change of food is required. Three or four pounds of it may be mixed with the horse's other grain.

Mote (*Phaseolus aconitifolius*).—A friend who has had a long experience among horses in India, tells me that equal quantities of *mote* and *gram*, bruised and given raw, form an excellent food for horses. I would suggest the daily addition of from 2 to 4 lbs. of dry bran to this mixture, but have no personal acquaintance with the value of *mote* as an article of forage.

Barley.—Next to oats, this grain is, in my opinion, the most suitable one for horses, which should be gradually accustomed to its use, for it is apt to disagree with them at first. It may be given raw and in a bruised state, or parched, which is probably the better plan, as the husk seems to possess an acrid principle, the effects of which appear to be obviated by the process of parching. A native parcher (*bhurbhúnja*) will charge a few annas a maund (82 lbs.) for parching. Boiled barley may also be used, especially for old horses. Barley should not be employed until it is at least a year old.

A mixture of parched barley and gram, known as *ardawa*, is commonly sold in India. It is usually made of inferior grain, and is always more or less adulterated with dirt and chaff.

INDIAN CORN.—This grain, known as *mukaee*, is very cheap and plentiful in some parts—the Punjab, for instance. In Europe and America, maize is usually regarded as a food that, without the addition of other grain, is not sufficient for the requirements of hard-working horses. The results of experiments conducted on a large scale in France and Austria, as well as observations made by practical men in other countries, prove that, although horses readily take to maize as a food, digest it, and on it get fat and acquire glossy coats, they show a marked deficiency in vigour, speed and stamina to animals fed on oats. Professor Bruchmüller, who conducted a six months' trial of feeding 5,200 horses partly on maize, came to the conclusion that it can be used to advantage only with horses that are not required to move out of a walk.

Hiram Woodruff, the celebrated American trainer, thus writes: "The grain should be oats of good quality. I do not let colts have corn at all when young; and even to old horses I think it should be fed very sparingly. . . . Above all, avoid Indian corn in all shapes for young colts. . . . Keep the corn for the bullocks and hogs, and give oats to the horses."

The experience, however, of horse owners in South Africa—where Indian corn and oat hay form the staple food for horses—places the food value of this grain in a more favourable light. The fact remains that the majority of South African mail-coach horses, which had to do 10 to 12 miles stages over bad ground at a fair rate of speed, got through their work well and kept in good condition on nothing but maize and oats or wheat chaff. At the same time, it was recognised by those in charge of coach and other horses in that country, that the addition of a few pounds of oats or of oat hay to the daily allowance of maize and chaff proved useful for imparting additional vigour to these animals. The coach horses—which were hardy, light-built animals of an average height of about 14 hs. 2 in.—get about 18 lbs. of maize and about 5 lbs. of chaff, with an occasional feed of grass on the *veldt*.

From my own observations made in South Africa, I have come to the conclusion that the quietness and want of spirit shown by the generality of horses in that country are, to a certain extent, due to the fact that Indian corn forms a large proportion of their food.

Maize may be given either whole, bruised, or soaked. To horses not accustomed to this grain, it is safest to give it bruised and mixed with either chaff or bran. In this state it might be slightly sprinkled with water, in order to keep down the dust which might arise from the finely divided particles, although I do not see any material benefit from this provision. If gradually brought on to its use, the grain may be given whole. Eating it in this state sometimes makes the animal's mouth sore, in which case bruised maize should be substituted. I have heard of maize in cobb (or husk) being given after having been passed through a particular kind of machine that cut up the head of the corn as well as the grain which it enclosed, and that this combination of grain and husk formed an excellent and easily digested food: it would certainly be an economical one. In South Africa, although the best judges prefer to give the grain dry rather than damp, still, it is frequently used after having been soaked overnight in a minimum of water, and then mixed with chaff. I do not see much objection to this practice, for the chaff takes up so much of the remaining moisture, that there is but little danger of the horse swallowing the grain without first chewing it. The danger to be feared from the improper use of maize is that it might produce colic.

It would be useless to deny that both in Europe and in America, maize, when given as the only grain, has been proved to be an unsuitable food for horses that have to do hard, and especially fast work. The question naturally arises: what is the cause of the difference between maize used in those countries and maize in South Africa? The correct answer to this is, I am convinced, that the difference does not lie in the respective values of the Indian corn, but in the material with which it is given. South African chaff is exactly like *tibben* (*p.* 61), and consequently it forms an admirable vehicle for the *mealies*, in that it separates the particles one from another, and by its softness allows the animal to masticate them thoroughly, whether the grain be whole or broken.

By examining the composition of maize (*p.* 69), we find that maize is exceptionally deficient in mineral matter (ash), a good supply of which is essential for maintaining the tissues, and especially the bones, in a state of health. Hence, in feeding hard-working horses on maize, this grain should be combined with a form of grain food which is rich in mineral matter, such as bran, for instance. By referring to the table on page 69, we see that bran contains nearly three times more ash than maize, and nearly twice as much ash as oats. Acting on these data, I have tried the experiment of feeding two hunters on equal quantities (by weight) of maize and bran during the past three years, and have obtained quite as good results as by feeding them on the best oats. Therefore, I strongly recommend the adoption of this combination to horse-owners in India.

WHEAT.—This grain is difficult of digestion, probably owing to the viscid nature of the gluten which it contains, preventing the different digestive fluids—saliva, gastric juice, pancreatic juice, etc.—from permeating through its substance. This objection could be more or less removed by the process of parching. Raw wheat given in large quantities is almost certain to gripe the horse.

Mr. Stewart (*Stable Economy*) mentions that a quantity of wheat, not exceeding 4 lbs., may be substituted for the same or a slightly larger amount of oats; that it should always be given mixed with bran or chaff; and that it should be bruised in the same manner as oats. In South Africa, I have known it to be given, without producing any ill effects, three times a day, in quantities of 2½ lbs., and mixed with chaff. For examples of its combination, see page 97.

A couple of pounds of boiled wheat, in which a little salt has been mixed, may be given at night when soft food is required.

CAKES (Hind. *chupatee*) made from the following constituents are often relished by delicate feeders:

Flour	1 lb.
Goor (see *p.* 54)	4 oz.
Ghee	2 „
Garlic	1 „

BRAN.—English bran consists almost entirely of the envelope which surrounds the grains of wheat, the flour being nearly all removed. The outer portion of this envelope is indigestible, and acts mechanically as a gentle laxative, while the inner layer (according to Mège Mouriès) has the same property as diastase in converting starch into sugar, and consequently aids in the process of digestion. English bran is therefore of itself unsuitable as a food. Indian bran, on the contrary, owing to imperfect manufacture, retains a considerable portion of the flour, which supplies nutriment; so that horses, doing slow work, may be kept in good condition on 10 or 12 lbs. of it alone, without other grain. Given even in these quantities, it hardly ever purges a horse. On the contrary, if an animal gets "foul" and "loose" from too much corn, nothing is better than to keep him simply on dry bran and grass for a few days; after which time his dung will become well formed and healthy-looking.

Dry bran seems to have a binding effect, or, at least, one opposed to a lax condition of the bowels. This is probably owing to a healthy action of the stomach and intestines being induced by bulk being given to the food, without the addition of a large proportion of nutriment which would have a stimulating effect.

Wet bran, in the form of a mash, is a laxative.

I am very partial to the use of bran for hacks and ordinary horses, when oats are not used, and would advise that 3 or 4 lbs. of it be given daily in a dry state. If we turn to page 70 we shall see that bran contains a large amount of mineral matter, of which a comparatively large proportion consists of phosphorus, which is essential to the growth and development of the various tissues.

With racehorses and others, the custom is to give a bran mash every Saturday night, or oftener, as the case may demand. Instead of a simple bran mash, I prefer to give one to which linseed has been added.

Bran Mashes are made as follows :—After scalding a stable bucket with boiling water, put into it about 3 lbs. of bran, with an ounce of salt, and pour in as much boiling water as the bran will take up, which will be about equal to the weight of the bran itself, calculating the gallon of water to weigh 10 lbs. The mash should then be well covered, so as to keep in the steam, and should be left to stand for a quarter of an hour, or twenty minutes.

Bran and Linseed Mashes.—Boil slowly from 1 to 1½ lbs. of linseed, for two or three hours, till the grains become soft, allowing only just sufficient water, so that at the end of the time it may, when the linseed is cooked, soak up a couple of pounds of bran, which is hen mixed in and the whole covered up, as before described. The thicker the mash, the readier will the horse eat it.

LINSEED.—This grain is the seed of the flax plant. It contains a large percentage of oil and is very useful for fattening horses that are low in flesh. It improves the condition of the coat in a marked manner and has a peculiarly soothing effect on the urinary organs. A linseed mash is the usual form in which it is given. If the making of this causes too much trouble, a quarter of a pint of the oil, mixed through the corn daily, may be substituted. Linseed is most beneficial in cases of a disordered state of the skin, difficulty in staling, and diseases of the organs of breathing.

Owing to the careless method of saving which is adopted by cultivators in India, the linseed that is sold in the bazaar usually contains a large proportion of mustard seed (Hind. *surson*), which is a small, round, light-yellow seed, and may be readily recognised by the taste it gives on being chewed. It should be carefully separated from the linseed; for, if it be consumed by the horse, it may have an injurious effect on his digestive and urinary organs. Rape and hempseed are also found in linseed. The former is a black seed of about the same size and shape as mustard seed. The latter is an oval and somewhat flattened seed, about half the size of a grain of wheat; and is of a light brown colour. A moderate consumption of rape and hempseed will cause no ill effect to the animal.

Linseed Tea may replace water as a drink, when it is necessary to give linseed, and when the horse will not take it readily in other forms. It may be made by boiling half a pound of linseed in two gallons of water for a couple of hours. The fluid should then be strained off and allowed to cool.

RICE.—In some parts of India, especially in Eastern Bengal, rice in husk, commonly called *paddy* (Hind. *dhan*), is much used, after it has been kept for one season. It is given raw and in a broken state. It forms a fairly good food. A mixture of one part of gram to two of rice is an excellent one for feeding purposes. Rice, without the husk, is quite unsuitable for horses.

Rice-water (Hind. *kanjee*), is most useful in cases of superpurgation, etc. It may be prepared by boiling a pound of rice in two gallons of water for a couple of hours. If time be of consequence, and boiled rice be at hand, a sufficient amount may be taken, and well macerated between the fingers in warm water, the whole being brought to the boil, and then allowed to cool.

SUTTOO.—This, mixed with water, is the Indian substance for gruel. It is usually composed of finely-ground parched gram and barley; but is sometimes made from Indian corn alone. It is always given in cold water, 1 lb. to half a bucket being the usual proportions. The horse gets his *suttoo* and water before his morning feed. I have never been able to discover any benefit to arise from its constant use. Syces are very partial to the practice of giving it: but more for their own sakes than that of their horses.

GOOR.—From one to two pounds of this kind of unrefined sugar, given daily as a *bonne bouche*, is useful for getting horses into condition, and for tempting the appetite of delicate feeders.

Carrots and other roots contain but a small amount of nutriment compared to their bulk; hence they are inapplicable for forming a large proportion of the food of horses which are called upon to do fast work. They have a good effect on the animal's general health, as they supply the system with certain important salts which tend to preserve the fluidity of the blood and to build up tissue. They are especially useful when the system is in a feverish condition, for then, owing to the increased waste of tissue, the blood becomes loaded with impurities and abnormally thick. They come into season during the autumn, and may, with great benefit, be given in quantities of 6 or 7 lbs. daily; 2 or 3 lbs. will be sufficient for racehorses.

Carrots are the best roots for horses, and, next to them, *parsnips*. *Swedes* may also be given. Horses in South Africa often get *pumpkins* as green food. Other roots may be given, in a boiled state, to animals used for slow draught.

" Carrots also improve the state of the skin. They form a good substitute for grass, and an excellent alterative for horses out of condition. To sick and idle horses they render corn unnecessary. They are beneficial in all chronic diseases of the organs connected with breathing, and have a marked influence upon chronic cough and broken wind. They are serviceable in diseases of the skin. In combination with oats, they restore a worn-out horse much sooner than oats alone." (Stewart.)

Dr. Voelcker points out that the nutritive value of different root-crops depends largely upon their state of maturity; that unripe roots are not alone poor in sugar—hence their decreased value—but also contain a number of organic acids (notably oxalic acid), and imperfectly elaborated nitrogenous substances, which appear to be the cause of their unwholesomeness; that the leaves of their roots contain a far larger proportion of oxalic acid than does the root itself—hence, the scouring effect produced when the leaves are given—and that moderate-sized and well-matured roots are far more wholesome than monster ones.

Grass and Hay.—I am convinced, from long experience, that the maintenance of good condition in the horse is much more dependent on the proper supply of grass than on that of corn.

The following are the best Indian grasses:

Doob (*Cynodon dactylon*), called *hurryalee* in Madras, is generally regarded as the typical form of good Indian grass. It is that peculiar root-grass which grows on, or rather in, the surface of most sandy soils, and spreads itself as a creeper, so that it has to be rooted up (*cheeled*) with a sort of trowel, which is called in Hindustanee a *khirpa*. When cultivated in good soil it looses its creeping character, and grows like English meadow grass; to which, I think, it is superior.

"*Digitaria sanguinalis* (called *janowa* in Hindustanee, and *poliaong* in the Punjab) is an excellent forage grass, and makes first-rate hay.

"In the Himalyas the finest of all grasses, superior even to *dhub*, is a kind called *maniara* by the natives, and *Pennisetum triflorum* by English botanists.

"Spear grass (*Heteropogon contortus*), called *lam* in the Punjab, is also very common in some parts of the country. The spears are long barbed processes at the end of the seed-covers. It is good fodder if given before the spears form; and even afterwards horses will thrive upon it, if it is well beaten so as to shake them off." (Meyrick.)

When the grass is brought in it should be opened out, carefully picked, dried in the sun for a day or two, as may be deemed necessary, and beaten, in order to get rid of the dust and earth that may adhere to its roots, before it is given. The grass-cutters should not be allowed to wash it, as they are inclined to do, before bringing it in with the object of making it look fresh and green, and, sometimes, to make it weigh heavy; for doing so is apt to dissolve out a portion of the sap, and will render the grass liable to ferment if kept tied up for a few hours. Besides, there is always danger of disease germs being conveyed to the grass from the water in which it may have been washed; for the filthiest pool will be considered by the grass-cutters quite good enough for this purpose. "It should be an invariable rule never to feed horses on grass grown in swamps, on account of the numerous lower forms of animal and vegetable life found in stagnant water. Horned cattle living on swampy land are particularly liable to anthrax; and there is no doubt but that this very fatal disease, called in India *Loodianah* fever (a form of anthrax), is often caused by horses either drinking stagnant water, or eating grass grown in it. Worm in the eye also appears to be produced in the same way." (Meyrick.)

I have abridged the following remarks on grass and hay from a paper by M. L. Grandeau, which appeared in the *Journal d'Agriculture Pratique* :

Growing grass possesses a waxy envelope, which protects the sugar, albumen, and other soluble compounds contained in it, from being dissolved by moisture and rain. When the grass is cut, this varnish gradually wears away, and if the grass be exposed to wet, it will then lose a considerable portion of its nutritive elements, especially if this envelope be bruised in any way. As long as the plant lives, it cannot be the seat of fermentation, which process is caused by the nitrogenous matters coming in contact with the sugar and water, on the breaking up of the different cells which compose the substance of the grass. During fermentation, the non-nitrogenous matters are turned into sugar, then into alcohol, and finally into carbonic acid, which is set free into the atmosphere in the form of gas. Thus, fodder which has been submitted to active fermentation soon loses most of its nutritive properties. When grass is cut, if the weather is fine and warm, so that desiccation takes place rapidly, the proportion of moisture soon falls so low that fermentation cannot take place. The hay remains upon the ground and cannot easily become heated, even though in reality it contains more water than fodder harvested in bad condition. The more rapidly hay is turned to the sun, the less will it be bruised; and the greener it is, the better it will resist fermentation when it is stored. Nevertheless, it often happens that a too rapid preparation injures fodder and in a good year hay appears to be saved in fine condition, when in reality it is not. If hay be completely dried in the sun it will not heat. A slight fermentation, far from being deleterious, is often very useful; in fact, we know that, in such a case, certain aromatic principles are produced which render fodder more sapid and perhaps even more nourishing. As long as the green colour remains, the hay has lost none of its quality. When it is much heated, it turns brown. Some cultivators prefer brown to green hay, and it is certain that the former frequently has more flavour and smell than the latter. Although horses may prefer brown hay, it is not at all desirable to leave sufficient moisture in the fodder at the time it is housed to turn it brown; because the loss resulting from fermentation is not counterbalanced by the slight aromatic smell it acquires.

Grass lands, unless of exceptional richness, require to be manured in order to keep up the quality, as well as the quantity, of the grass produced. Poor and. impoverished land produces very inferior fodder, On the other hand, as pointed out by Mr. H. S. Thompson (*Journal of the Royal Agricultural Society*, 1872), if land be treated with an excess of manure rich in nitrogenous matters, as guano and nitrate of soda, the luxuriant grass thus produced will be of inferior quality, and will prove unwholesome. The same remark applies to carrots and other roots.

STRAW AND CHAFF.—When horses are fed in the ordinary way, on corn and hay, or on corn and grass, there is no objection to allowing them to eat wheat or oat straw, which, if they be that way inclined, they will generally select from their bedding. Wheat and oat straw are more easily digested than barley straw; all three kinds being better than rice straw. I have noticed that in England some horses will not thrive unless they are allowed to eat a portion of their straw bedding. This is probably owing to the fact that, for the digestion of the highly-nutritious food upon which they are fed, they require an additional amount of bulk, which the straw supplies. In India, sufficient bulk will generally be obtained from the grass which the animal consumes. Although "long straw" may be a useful adjunct to grass or hay, as a food, I do not think it advisable to give it alone and in large quantities, with the corn; for it will then be liable to produce obstinate constipation. Its consumption, to the exclusion of hay or grass, is supposed to be a fruitful cause of roaring among Scotch cart-horses. The breaking or cutting up of straw into small pieces seems greatly to increase its food value when given with grain; apparently on account of the "chaff" facilitating more thorough mastication of the corn by separating the grains or particles of the corn one from another, and by more evenly distributing the pressure of the teeth on them. We may readily see that, for the performance of this work, it is better to have the different pieces of chaff soft than hard, although the softness should be obtained by bruising or tearing, and not by the application of moisture. In Egypt, Syria, Arabia, and other Asiatic countries, the chaff is formed from wheat or barley straw which is broken up into small pieces and is thoroughly bruised by the native threshing machine (Arabic, *noraj*), and is then called *tibben.* A mixture of barley and *tibben* forms the staple food of vast numbers of Eastern horses, which, except on rare occasions, get no other forage, and which keep in excellent condition on it. Horses would not thrive as well on ordinary chopped straw, thus given, as on *tibben.* A similar practice is carried on in South Africa, where the chaff is made principally from wheat straw, which is bruised and broken up into small pieces during the process of threshing, performed by horses and mules trampling upon the stalks of corn. In places where this bruised chaff could not be obtained, it would be very useful to have a special machine which could bruise and break up the straw in this manner, were it desired to use straw as a food for horses.

OAT HAY AND WHEAT HAY.—Oat hay is largely used in the Australasian Colonies and in South Africa, where it is called " forage ", either as an addition to or as a substitute for ordinary hay or grass. The oats for this purpose are cut when the grain has just lost its milkiness, and when the green stalk is beginning to turn in colour; the object being to get as much flour in the grain as possible, without allowing the stalk to become hard and dry. We must remember that should the grain be allowed to ripen, the sheaves would bear transport badly, for even a moderate degree of shaking would then cause a large proportion of the grain to fall out of the ears. In South Africa, oat hay frequently replaces hay and grass entirely in the feeding of horses—and with good results. Racehorses in that country are fed entirely on "forage" (as a substitute for hay) and oats, in which case about six inches of the lower end of the stalks of the oat hay are cut off. I must, however, say from personal experience that I do not think that racehorses trained on this food show as good condition as those which are prepared in India on *doob* grass and oats; notwithstanding that the Indian oats are inferior in quality to those grown in South Africa. I am therefore of opinion that although oat hay is a valuable adjunct (as I have often proved it to be) to *doob* grass, it is not altogether a satisfactory substitute.

Wheat hay, prepared like oat hay, can be used in place of the latter, though it is not as good. Green oats or green wheat may be used as green food for horses, in the same way as lucern, etc., would be employed.

KURBEE.—*Kurbee*, which is the stalks of Indian millet, called in Hindustanee, *ju'war* (*Holcus sorghum*, or *Sorghum vulgare*), or *bajra* (*Panicum spicatum*), may be given, without being prepared in any way, in quantities of about 25 lbs. daily, as a substitute for grass for feeding and bedding, when grass is scarce. *Ju'war* is known in Madras as *cholum*.

BAMBOO LEAVES.—In some parts of Eastern Bengal these leaves are used as a substitute for grass, which purpose they answer fairly well; although, sometimes, they have too laxative an effect.

LUCERN.—Lucern forms the best green crop for use during the hot weather. The seeds are readily procurable, and the plant, as a rule, grows well in India, provided it gets a sufficiency of water. When out of work, 8 or 9 lbs. of it will be a good allowance for each horse; half to be given after the morning feed, the rest during the afternoon. It is advisable to dry it for half an hour or so in the sun before the horse eats it.

MILK.—For sick or delicate horses, milk is often most valuable, and they will seldom refuse it. Sweet skim-milk is preferable to new milk, which, from being too rich, is very apt to purge the horse. A couple of gallons may be given daily. To correct any tendency it might have to produce diarrhœa, the milk should be boiled in a clean vessel, care being taken not to smoke it during the process. Sugar or a little salt may be added.

STOWAGE OF GRAIN.—Grain may be kept sweet, and free from the attacks of rats and mice, in large earthen jars (Hind. *mutka*). They will hold about 600 lbs., are very cheap, and can be easily procured.

Bags, capable of holding about a ton, may be employed. Each bag should be placed on a wooden stand. There is generally some difficulty about protecting them from the attacks of vermin.

Native grain-sellers generally use receptacles (Hind. *kothee*), made of thin bamboo wicker-work plastered over with clay, or with clay and cow-dung.

If a large quantity of grain has to be stowed away, a granary may be constructed as follows: Trace on the ground a circle of about 16 feet in diameter, and build on its circumference twelve or thirteen brick pillars, say 18 inches square and 2½ feet high, and, at its centre, a circular pillar of the same height, and about three feet in diameter. On these pillars construct a boarded floor, and build on it a strong bamboo wicker-work house, 9 or 10 feet high. This is plastered over, a small door is left at the top, and a light thatched roof is put over the whole. A house as described would hold about 25 tons of oats and would cost little to build.

Measures and Weights of Grain.—A Bengal *mun* (*Anglice* maund) is about 82 lbs. In England the following measures are used:

4 quarterns (quarts)	1 gallon.
4 gallons	1 bushel.
8 bushels	1 quarter.

A quartern or feed of oats weighs about 2½ lbs.

CHAPTER IV

SKETCH OF THE THEORY OF FOOD AND NUTRITION

Composition of the body—Waste of tissue—Repair of waste—Analysis of forage—Analysis of the ash of various plants and seeds—Nitrogenous food—Fat, starch, and sugar in food—Heat supply—Mineral substances—Husk of grain—Bulk in food—Selection of food—Hay and grass—Green food—Variety in food—Salt—Relations of cold, heat, and clothing to food—Mastication and digestion—Functions performed by the blood—Appetite—Influence of an artificial state of life—Preparation of food.

Composition of the Body.—Nearly four-fifths of the body of the horse is composed of water, the remainder being made up of various organic and inorganic compounds. The former may be subdivided into substances containing nitrogen—a gas which exists mixed with oxygen in the atmospheric air—and substances which are wanting in that element. The latter comprise the different mineral matters of the system, such as common salt, the carbonate and phosphate of lime, and carbonic acid, with traces of ammonia. The non-nitrogenous compounds may be put under two classes; namely, fats, and saccharine substances (carbohydrates), such as milk and sugar.

Every tissue of the body which is employed in the performance of labour—such as the muscles, tendons, nerves, glands, etc.—is composed of substances that come under the nitrogenous group; "even the non-cellular liquids passing out into the alimentary canal at various points—which have so great an action in preparing the food in different ways—are not only nitrogenous, but the constancy of this implies the necessity of the nitrogen, in order that these actions shall be performed." (Parkes.) White of egg (albumen) is a familiar example of this group. These nitrogenous substances consist of carbon—of which charcoal is a well-known form—hydrogen and oxygen—the two constituents of water—combined in various proportions with nitrogen, and, in the case of albuminous substances, with a small amount of sulphur.

Both the fats and saccharine matters are composed of certain combinations of carbon, hydrogen and oxygen. In the latter, the two last-mentioned elements are united in the proportion that forms water, so that sugar and starch may be regarded as a combination of carbon with that fluid; but in the former there is a small amount of oxygen. The fat, which is deposited as a layer immediately under the skin, serves to maintain the internal temperature of the body, by the fact of its being a bad conductor of heat. Fat also acts as a natural elastic cushion to various parts of the system, as, for instance, at the back of the eyeball, above the horny frog, and around the joints.

Dr. Carpenter remarks that "the muscular, nervous, and glandular tissues are not composed of albuminous substances alone; they contain, as an essential constituent of their structure, a certain portion of fat, without which their composition would be imperfect, and the performance of their functions impossible." Such fat, he points out, must therefore be regarded as a tissue-former, and not alone a supplier of heat, although it will serve in the latter capacity on becoming broken up.

Waste of Tissue.—Every tissue of the body has a certain limited time for existence (a period which is directly shortened by exercise), after which it becomes broken up, and is absorbed into the blood. In order to remove these effete and deleterious matters, the system is provided with various excretory organs, such as the lungs, kidneys, etc. During respiration, the oxygen, which is absorbed from the air by the blood vessels in the air cells of the lungs, is carried through the various parts of the body, so that it may break up the effete tissue by combining with the carbon to form carbonic acid, which the blood, at the completion of its circuit, conveys to the lungs, to be by them expelled into the atmosphere.

A small amount of carbonic acid is eliminated by the skin.

We may roughly express the oxidation of the various tissues as follows:

1. Fat + oxygen = carbon + hydrogen + oxygen + oxygen = carbonic acid + water.
2. Sugar + oxygen = carbon + water + oxygen = carbonic acid + water.

3. Albumen + oxygen = carbon + hydrogen + nitrogen + oxygen + oxygen = carbonic acid + water + degraded nitrogenous matters, such as urea, etc.

The carbonic acid, as stated, is got rid of by means of the lungs, which, together with the kidneys and skin, eliminate water; the degraded nitrogenous matters and broken-up mineral substances being excreted by the kidneys.

Repair of Waste.—In order to supply material for the repair of the constant waste experienced by the system, the animal must have food which shall answer the following conditions:—

1. It must contain a proper proportion of the elements necessary for the building up of the new tissue.
2. It must be digestible.
3. It must be of sufficient bulk for the stomach and intestines to act on it.
4. It must be palatable.

Grain, grasses, and roots, used in suitable proportions, answer the above conditions. As chemistry enables us to analyse these foods we may, by its aid, approximately judge of their respective nutritive values. The following tables may serve as a guide to the reader:

ANALYSIS OF FORAGE.

Compiled from the writings of Drs. Voelcker, Parkes, Letheby, and Professors Wolff and Knop.

	Albuminoids.	Starch and Sugar.	Fat.	Ash.	Crude fibre.	Water.
Grass before blossom	3.0	12.1	0.8	2.1	7.0	75.0
„ after „	2.5	14.3	0.7	2.0	11.5	69.0
White clover, full blossom	3.5	7.2	0.8	2.0	6.0	80.5
Lucern in blossom	4.5	6.3	0.7	2.0	12.5	74.0
„ very young	4.5	7.2	0.6	1.7	5.0	81.0
Meadow hay	8.2	39.2	2.0	6.2	30.0	14.3
Lucern hay	14.4	20.0	2.5	6.4	40.0	16.7
Rye-grass hay	10.2	36.2	2.7	6.5	30.2	14.3
Barley straw	3.0	31.3	1.4	7.0	43.0	14.3
Oat straw	2.5	36.2	2.0	5.0	40.0	14.3
Wheat straw	2.0	30.2	1.5	5.5	48.0	14.3
Carrots	0.7	7.7	0.2	0.9	3.5	87.0
Parsnips	1.3	7.7	0.5	1.0	7.5	82.0
Swedes	1.5	6.0	0.2	0.7	2.1	89.5
Barley	9.5	64.1	2.5	2.6	7.0	14.3
Beans	25.5	43.5	2.0	3.5	11.5	14.5
Beer	0.1	8.7	—	0.2	—	91.0
Bran	14.0	46.2	3.8	5.1	17.8	13.1
Dates	10.93	63.4	0.19	1.5	2.38	21.6
Egg, white of	20.4	—	—	1.6	—	78.0
„ yolk of	16.0	—	30.7	1.3	—	52.0
Gram (husked)	22.7	63.18	3.76	2.6	—	11.39
Hempseed	16.3	21.6	33.6	4.2	12.1	12.2
Kúlthee (husked)	23.27	59.38	2.2	3.19	—	12.03
Linseed	20.5	18.0	37.0	5.0	7.2	12.3
Maize	10.0	61.0	7.0	2.1	5.5	14.4
Milk	4.04	4.62	3.08	0.71	—	87.55
Millet	14.5	59.1	3.0	3.0	6.4	14.0
Oats	12.0	54.9	6.0	3.0	10.3	14.3
Peas	22.4	49.8	2.5	2.5	9.2	14.3
Rape seed	19.4	15.4	40.0	3.9	10.3	11.0
Rice	6.3	79.5	0.7	0.5	—	13.0
Urud	24.73	58.76	1.36	3.17	—	12.44
Wheat	13.0	66.1	1.5	2.0	3.0	14.4
Lentils	23.8	49.4	2.6	3.0	6.9	14.3

ANALYSIS OF THE ASH, IN 1,000 PARTS, OF VARIOUS PLANTS AND SEEDS, MADE BY PROFESSORS WOLFF AND KNOP.

	Ash.	Potash.	Soda.	Lime.	Phosphoric pentoxide.	Silica.
Young meadow grass	20.7	11.6	0.4	2.2	2.2	2.1
Green lucern ..	17.6	4.5	0.2	8.5	1.5	0.4
Rye grass	21.3	5.2	0.9	1.6	1.7	8.4
Meadow hay ..	66.6	17.1	4.7	7.7	4.1	19.7
Lucern hay ..	60.0	15.2	0.7	28.8	5.1	1.2
Barley straw ..	43.9	9.3	2.0	3.3	1.9	23.6
Oat straw	44.0	9.7	2.3	3.6	1.8	21.2
Wheat straw ..	42.6	4.9	1.2	2.6	2.3	28.2
Barley	21.8	4.8	0.6	0.5	7.2	5.9
Beans	29.6	12.0	0.4	1.5	11.6	0.4
Bran	55.6	13.3	0.3	2.6	28.8	0.6
Carrots	8.8	3.2	1.9	0.9	1.1	0.2
Linseed	32.2	10.4	0.6	2.7	13.0	0.4
Maize	12.3	3.3	0.2	0.3	5.5	0.3
Millet	39.1	4.7	0.4	0.4	9.1	20.5
Oats	26.4	4.2	1.0	1.0	5.5	12.3
Paddy	69.0	12.7	1.3	3.5	32.6	0.4
Peas	24.2	9.8	0.9	1.2	8.8	0.2
Rice	3.4	0.8	0.2	0.1	1.7	0.1
Wheat	17.7	5.5	0.6	0.6	8.2	0.3

Iron oxide, generally present to the extent of less than one per cent., is omitted; also, magnesia, sulphur, etc., which are found in still smaller quantities.

In the foregoing table, the analysis of oats is that of good English corn, which, I may say, does not contain more than half the proportion of woody fibre found in the Indian variety.

Owing to the indigestibility of bran, its nutritive value is not in accordance with its chemical composition. This want of agreement is also apparent in other foods, notably in wheat and potatoes. The portions of bran which cannot be digested serve a useful purpose in giving bulk to the food, and in stimulating the digestive canal by the slight mechanical irritation which its presence causes.

The nitrogenous matters contain from 15.4 to 16.5 per cent. of nitrogen. (Parkes.)

NITROGENOUS FOOD —The natural waste of nitrogenous tissue is accelerated by exertion, though to a far smaller extent than is that of fat. From the analysis of the urine of men, taken while they were undergoing violent exertion, it was observed that there was but a small increase in the waste of nitrogenous products, which, as before remarked, are excreted by the kidneys. Experience, however, demonstrates the necessity, in such cases, of an adequate supply of nitrogen, as may be seen by the good results obtained from the addition to oats of beans, in England—or of gram, or *kúlthee*, in India—especially, when, from old age, or illness, the horse's powers of assimilation are diminished. Such a diet, however, should be carefully regulated, for an over-supply is apt to upset the animal's digestion, and to poison his blood by causing it to become filled with an excess of deleterious nitrogenous products, which the excretory organs will be unable to eliminate with sufficient rapidity. We may often witness the baneful effects—in the form of diarrhœa, filled legs, and a general "heated" state of the system—of the consumption of too much gram, or *kúlthee*.

FAT, STARCH, AND SUGAR IN FOOD.—These constituents are, by the process of digestion, utilised in the formation of fat; the first named being absorbed without undergoing any organic change. Its excess is apt, especially during idleness, to cause derangement of the liver, from its accumulating to an injurious extent in the cells of that organ; and also tends to produce fatty infiltration and degeneration of various tissues, rendering them unable to bear the strain of violent exertion. Too large a supply of sugar also acts in a similar but less energetic manner. An excess of starch appears to exert little or no injurious effect; for what is not required seems to be harmlessly expelled with the dung. Thus, we see that the bad results of an excess of either fat, sugar, or starch are in a direct proportion to the ease with which they are assimilated. When an animal is in poor condition, the *value* of these foods is in the same ratio.

Nitrogenous matters are also capable of forming fat; for in them we find the necessary carbon, hydrogen, and oxygen. This process of obtaining fat from nitrogenous food probably takes place to a far slighter degree among the herbivora than among the carnivora, whose bodily weight and internal temperature can be sustained on a diet of lean meat alone.

When long-distance walking and swimming came into vogue years ago it was thought that concentrated food, of a highly nitrogenous nature, was the most suitable for the athlete while attempting such feats. The fallacy of this was proved by experience; for it was found that incomparably greater trials of endurance were performed under a regimen rich in fat, than under the old system of training on lean meat and dry bread. This was notably shown in the case of Gale, while walking 1,500 miles in 1,000 hours; for his diet consisted of ordinary meat, buttered toast and bread, eggs, etc. Gale, it must be remembered, while performing his remarkable feat, walked 1½ miles at the commencement of each consecutive hour. In the days of our forefathers, Captain Barclay astonished the athletic world by walking 1,000 miles in 1,000 hours. He, however, by having been allowed to do a mile at the end of one hour, and another at the commencement of the next hour, was able to procure, between his tasks, more than double the length of rest which was given to the Cardiff man. Weston, the pedestrian, was, I believe, one of the first to demonstrate in England the advantages of this system. Webb, the Channel swimmer, too, was another instance. Indian wrestlers, who always train on a diet rich in fat, have for ages worked on true physiological principles. I am convinced that the fact of modern feats of endurance, totally eclipsing the performances done in former days, is mainly owing to a larger supply of fat and starch having been introduced into the diet of athletes. This lesson we should utilise in the case of hard-worked horses. Unfortunately, our choice of food here is but small, when we are limited in the matter of expense, except in the case of linseed, which is a very suitable article. We might, however, in some cases supplement it with milk, eggs, *ghee* (clarified butter), and *goor* (unrefined sugar).

We find that, for the maintenance of health, a man requires in his food a supply of fat as well as starch, and that the former cannot be replaced altogether by the latter. The horse, it appears, is more independent of a supply of fat in his diet; but whether it can be dispensed with altogether is a question I am unable to answer. The fact, however, of the existence of a certain, though varying, proportion of fat in the natural food of the animal, indicates its value, if not its absolute necessity. In the daily diet, given by Dr. Parkes, for a man performing very laborious work, we find that the fat is to the starch and sugar as one is to four. The proportion for a horse on a full supply of oats and hay is about one to sixty.

In food for horses, it appears that sugar may be entirely replaced by starch, though the converse of this does not hold good.

HEAT SUPPLY.—The constant oxidation of carbon and hydrogen—attended by the formation of carbonic acid and water—in the various tissues is accompanied by the evolution of heat, which serves to sustain the internal temperature of the body of the horse at about 100.5 F. During exercise there is a proportionate increase in the amount of tissue broken up by these chemical combinations taking place; but the greater portion of the excess of heat appears to be utilised by its becoming converted into motion, for we find that after rapid movement, which is necessarily accompanied by considerable waste of tissue, there is but a very slight increase in the temperature of the body. This is in accordance with the fact that heat and motion are but modifications, though under different forms, of force.

MINERAL SUBSTANCES.—These, with the exception of common salt, are obtained in ample sufficiency from the various grasses. Corn contains them in a far smaller proportion (*p.* 70): hence the necessity of the former food. We may observe, as before remarked, that bran contains a large proportion of phosphorus, which is an indispensable factor in all the functions of life.

The phosphates of lime and magnesia, the carbonate of lime, and silica are the chief agents that give solidity to the bony skeleton. The phosphate and carbonate of soda "would seem to have as their chief purpose the maintenance of the alkalinity of the blood, on which depends not merely the solubility of its albumen, but the facility of its passage through the capillaries, and the readiness with which its combustive materials are oxidised, whilst they also increase the absorptive power of the serum for gases, and thus play an important part in the respiratory process. The salts of potash appear to be specially required for the nutrition of the muscles and nerves, since they are largely present in the fluids and ashes of these tissues, but they probably exert the same general influence as those of soda. . . . The presence of the earthy salts, on the other hand, would seem to have reference almost exclusively to the composition of the tissues, into which some of them enter very largely." (Carpenter.) Iron is principally found in the red corpuscles of the blood, in the muscles, and in the hair.

Husk of Grain.—The office of the husk of grain appears to be that of furnishing mineral matters, and of giving bulk to the food. It also seems, by mechanical irritation, to increase the worm-like motion of the bowels, which tends to obviate the ill-consequences which might arise from the decomposition, in the intestines, of the unassimilated nitrogenous matters of the corn; a possibility likely to occur owing to the unstable nature of the compounds of nitrogen. Both from theory and practice we may safely conclude that the husk should not be removed from the grain which the horse is to consume.

We may see from the foregoing observations that the working parts of the animal machine are formed of nitrogenous and mineral substances, with a small amount of fat; the motor power being obtained from heat generated by the oxidation of fat, and also of the component parts of the machine itself.

Bulk in Food.—The fact that the horse's intestines are of large capacity, indicates that his food should be of a bulky nature. The intestines have a worm-like motion, which causes the food to become thoroughly mixed with the intestinal juices, its various particles to be presented to the absorbents—which take up the nutritive matter—and the remainder to be expelled onwards. They possess this power of motion from the fact of one of their coats being a layer of muscle, which contracts when it is stimulated by the presence of food. The more bulk the food has, speaking generally, the less have the intestines to contract in order to move it about. If this condition of bulk be not complied with, the digestive apparatus will get out of order, however accurately materials for building up tissue be supplied. Indigestible woody fibre—contained in large quantities in the various grasses—and unassimilated starch chiefly serve the required purpose. The fact that, within certain limits, the measure of a horse's appetite is by bulk and not by weight, is evidently due to the necessity the animal feels of having his intestines filled. We see the same craving for bulk evinced by human beings. "The Kamschatdales, for example, are in the habit of mixing earth or sawdust with the train-oil on which alone they are frequently reduced to live. The Veddahs, or wild hunters of Ceylon, on the same principle, mingle the pounded fibres of soft and decayed wood with the honey on which they feed when meat is not to be had; and on one of them being asked the reason of the practice, he replied: 'I cannot tell you, but I know that the belly must be filled.'" (Carpenter.)

Selection of Food.—For all practical purposes, we need not consider grain beyond its use as a former of fat, and of nitrogenous tissues, such as the various muscular and nervous structures. To give bulk to the food (except in the case of horses getting as much oats as they can eat), and to supply the requred mineral matters, we must principally depend on grass. As exercise directly increases the waste of tissue, we must add to the amount of grain according to the degree of labour, though, at the same time, allowing an unlimited supply of hay, in order to comply with the conditions just stated. The exceptions to this rule are: when the horse is in a state of enforced idleness; when his appetite is in a depraved or abnormal condition; and when he is required for immediate work.

When a horse's powers are fully taxed, he should be allowed as much hay and suitable corn as he chooses to consume. This leads us to the pertinent question: "What proportion should the nitrogenous matter in grain bear to the starchy constituents?" From the teaching of experience, which in this case can alone direct us, we may learn that for moderate work it should not exceed that which is contained in oats, namely, 10 to 47 (approx.). To find the maximum, we may assume a diet of four parts of oats and one part of beans (as given in England to hard-worked animals), which will give us the proportion of 10 to 38 (approx.).

To determine the maximum amount of nitrogenous food, I think we may safely assume it to be about that contained in 20 lbs. of oats, namely, 2½ lbs. (approx.). If forced by circumstances to use a grain, such as gram, or *kúltbee*, which is too rich in nitrogen, this should be done at the expense of the starch, but should on no account exceed the amount of nitrogen already laid down; for an excess will tend to produce the derangements of the system which have been already mentioned.

Respecting the supply of fat, I am unable to say anything more definite than I have done in the previous pages of this chapter. Dr. Parkes' proposition that "if men are undergoing great exertion, they take more food, and, if they can obtain it, the increase is especially in the classes of albuminates and fats," holds equally well with regard to horses.

HAY AND GRASS.—We may consider these two to be almost the same kind of food, except that the former contains a lesser proportion of water.

I have previously argued that a horse should get a full supply of hay under all circumstances, except when he is unable to take sufficient exercise.

A horse, omitting exceptional cases, evinces a marked preference for corn compared to hay; hence we may assume that, when he turns from the former to the latter, he does so from the prompting of an instinct which is intended by Nature to guide him in the selection of the food most suitable for the requirements of his system. We need hardly dwell on the not uncommon folly of stinting a horse of his hay, when the object is to get him to eat as much corn as possible in order to enable him to sustain violent and continued exertion, such as that demanded during the training of racehorses. I have always found that such animals eat more corn and digest it better when their supply of hay is unlimited at all times, than when it is curtailed, and especially so when they are deprived of it during feeding hours. The idea that a groom, trainer, or owner, can tell to a pound how much hay his hard-worked horse should eat, is palpably absurd. The case of corn is very different; for a horse, unless his powers are fully taxed, is almost always prone to eat too much of it, and its bad effects are patent to the most careless observer. General Sir F. Fitzwygram writes that, "practically it will be found that horses, which are not limited as regards oats, will not usually consume above 6 lbs. of hay per diem." Surely no one could say that this was an inordinate amount? As regards training, I have often been met with the objection that horses would gorge themselves, and would even eat their bedding, unless muzzled; but I have never found this to occur when a full supply of oats has been given, although I have had several horses in training that came to me with the character of being insatiable gluttons.

I desire to lay considerable stress on the subject of allowing horses hay during feeding hours, as I have always found this practice to be attended with the best results, for not alone is the condition of bulk complied with, but also irritation to the alimentary canal, resulting from the presence of stimulating food, is avoided as much as possible by the corn becoming diluted by the hay. To see how reasonable this practice is, we need only apply the case to ourselves with respect to the meat and vegetables we consume at our meals.

Green Food.—The necessity of a supply of *fresh vegetables* as a part of human food is clearly recognised. In the same manner we find that green food is almost equally as indispensable for horses. This is especially the case when the hay which is used has been subjected to a process of fermentation, which gives it a brown appearance, and often increases its sweetness, although it diminishes its value. This method of curing hay is seldom adopted in India, where an ample supply of *doob* grass will fairly fulfil the conditions supplied by green food and ordinary hay.

Variety in Food.—As far as my experience goes, I have been unable to notice any marked good arising from a change of food, unless the new article of diet contained elements of nutrition deficient in the other.

Salt is the only necessary food adjunct that is not supplied in sufficient quantity by the grain and grass consumed by the animal. A moderate excess of it can in nowise prove injurious; for it will be speedily eliminated by the kidneys, after the system has taken up sufficient for its own requirements. It furnishes the elements for the supply of the hydrochloric acid which is a constituent of the gastric juice. It also plays a most important part in the whole nutrition of the body. "It was demonstrated by Boussingault that when, of two sets of oxen, one was allowed the unrestricted use of salt, whilst the other was as far as possible deprived of its use, a marked contrast was observable in the course of a few weeks between them, and manifestly to the advantage of the former. The desire for common salt on the part of animals and man is extremely powerful, leading the former, especially if they be vegetable feeders, to traverse great distances to reach saline deposits." (Carpenter.)

Relations of Cold, Heat, and Clothing to Food.—When the temperature of the surrounding air falls much below its normal degree, a proportionate increase of starch and fat, to keep up the natural temperature of the body, should be made to the food of the animal, if it be unsupplied with warm clothing, which, by preventing radiation, supplements the action of the fatty layer which lies immediately underneath the skin. Hence a judicious addition of clothing may be practically regarded as an addition to the food;

so that, when it cannot be made, more corn ought to be given. In hot weather the animal will naturally require less food.

MASTICATION AND DIGESTION.—The long hairs about the horse's muzzle serve him as feelers in the selection of the food which his lips convey into his mouth, aided, when the fodder offers some resistance, by the front teeth (*nippers*, or incisor teeth). The mouthful is then conveyed to the grinders, and is ground by them into a pulp. During this operation it becomes mixed with saliva, which, under the stimulus of the food, flows into the mouth from the different salivary glands. This secretion contains the active principle *ptyalin*—a kind of ferment—the office of which is to convert starch into dextrine (a kind of mucilaginous starch) and subsequently into grape sugar, in which form it is absorbed by the system. "A large proportion of this albuminous principle is present in the saliva of the horse, but only traces of it exist in that of man." (Carpenter.) The amount of saliva secreted during mastication is proportional to the hardness and dryness of the fodder. Lassaigne gives, from experiment, the following results :

100 parts of dry	hay	require	406	parts of saliva.
,,	barley	,,	186	,,
,,	oats	,,	113	,,
,,	grass	,,	49	,,

"Bernard was led to suggest that the submaxillary gland ministers to the sense of taste, whilst the parotid is connected with mastication, and the sublingual with deglutition. The size of the parotid in animals is proportionate to the degree in which the mastication of their food is performed. It is large in the horse, which lives on comparatively dry food, less in carnivora, and still less in the aquatic mammals, as the seal. It is absent in birds which swallow their food whole." (Carpenter.) The salivary glands of the horse are larger than those of all other animals, except ruminants.

The presence of saliva in the food materially aids its digestion in the stomach. "Among the experiments are those of Spallanzani and Reamur, who found that food inclosed in the perforated tubes, and introduced into the stomach of an animal, was more quickly digested when it had been previously impregnated with saliva than when it was moistened with water. Dr. Wright also found that if the œsophagus [gullet] of a dog is tied, and food mixed with water alone is placed in the stomach, the food will remain undigested though the stomach may secrete abundant acid fluid, but if the same fluid is mixed with saliva, and the rest of the experiment similarly performed the food is readily digested." (Kirkes.)

Saliva is alkaline, and gastric juice acid. Pancreatic juice and bile are both alkaline. This alternate character seems to have been given to these fluids so as to regulate their action.

The chief part of the starch contained in the horse's food passes unchanged into his stomach; and the action of the alkaline saliva, as a ferment in converting this starch into sugar, ceases on being neutralised by coming into contact with the acid gastric juice. Hence it would appear that the chief office of the saliva is to check undue acidity in the stomach.

The frothy nature of saliva seems to aid digestion. "The numerous air-bubbles for which saliva is remarkable have their special purpose; since the presence of atmospheric air in the stomach is accessory to digestion." (Leared.)

I submit that the foregoing observations indicate, as a general rule, the advisability of giving grain in a dry state.

The presence of salt in the food excites the flow of saliva in the mouth; hence, if boiled or steeped food be used, it should be given mixed with that condiment; because, owing to the moist and soft state of the grain, a deficient amount of saliva will be secreted.

Having reached the horse's stomach—the capacity of which is from 3 to 3½ gallons—the food becomes mixed with the gastric juice, which flows slowly at first. This secretion is liable to become checked by violent exercise, or by the stomach becoming unduly distended. If it be largely diluted with water, its action will be arrested, until the excess of that fluid be absorbed. Cold also stops the performance of its functions; for it will not act at a temperature much below blood heat. A moderate supply of hot spices stimulates its secretion. When the supply or action of the gastric juice—which is a natural antiseptic—is checked, the food that is in the stomach at the time is apt to become decomposed, with the probable result of indigestion, flatulent colic, and even rupture of the stomach, caused by the evolution of gas. Hence we may conclude that horses ought not to be watered soon after being fed, and that they should not be given large supplies of boiled food which is very bulky in comparison to the amount of nutriment it contains, and can also be rapidly swallowed. Besides, exciting only a small secretion of saliva, it arrives in the stomach in an unprepared state, and is consequently liable to become decomposed before the gastric juice can act on it.

The antiseptic property of gastric juice is well shown by the immunity with which many races of men eat putrid flesh and fish.

The active principle of gastric juice—*pepsine*—converts the nitrogenous matters of the food into a soluble form—*peptone*—and also serves to split up the fat into a state of fine division by dissolving the nitrogenous envelopes which enclose the globules. When the food—now called *chyme*—leaves the stomach and enters into the small intestine, it becomes mixed with bile and pancreatic juice, which flow from a common duct. The action of the fluid which comes from the pancreas (sweetbread) is very similar in its nature to, though much more enegetic than, that of the saliva, the work of which, in converting starch and cane sugar into grape sugar, it completes. It also, like gastric juice, dissolves albumen. By virtue of its alkaline nature, it makes an emulsion, or soap, with the fat contained in the *chyme*, which consequently assumes a white appearance, and is then termed *chyle*. The particles of fat are thus split up into a very fine state of division, and may be absorbed in an unchanged state. The bile acts as a natural purge, the bowels becoming constipated when it is deficient in quantity. It also, by reason of its slightly antiseptic properties, prevents decomposition of the ingesta, prior to their being expelled. In the absence of bile, deleterious gases are evolved in the intestines, and are absorbed into the system, to the detriment of the health of the animal; in which case the dung has a foul smell. Bile is constantly being excreted by the liver. Certain of the higher animals, such as man, are provided with a gall-bladder, into which this fluid collects, to be poured out into the intestines during the process of digestion, which is, in these cases, intended by Nature to take place at certain intervals. The horse, however, possesses no gall-bladder, which fact clearly indicates that he should be more or less constantly supplied with food. The fact of his stomach being of small capacity, and his intestines of large size, points to the same conclusion.

On leaving the small intestine of the horse, which is about 72 feet long, the food becomes collected into a capacious *cul-de-sac*—the cæcum—formed by the large intestine, the length of which is about 20 feet. The cæcum appears to be a kind of supplementary stomach, in which is collected the pulpy mass of water and unassimilated food which the stomach and small intestine have failed to take up. Here the remaining nutritive particles are dissolved out and absorbed. The cæcum can contain about 6 gallons of fluid.

FUNCTIONS PERFORMED BY THE BLOOD.—As the nutritive part of the food becomes changed into forms capable of being assimilated, it becomes gradually taken up by the minute vessels, called *absorbents*, that line the interior of the stomach and intestines, and is conveyed into the blood, which ramifies through the various tissues of the body, and which supplies them with materials for repair. Thus the blood acts as the vehicle for removing the products resulting from the waste of tissue, and also for furnishing the elements required in the building up of new structures.

APPETITE.—Appetite serves two purposes—(1) When the system requires new elements for repair, it prompts the animal to eat, so as to obtain them from his food. But, in order to avoid excess, the process of feeding should be carried on slowly. On this subject, Dr. Carpenter remarks:—"To eat *when* we are hungry is an evidently natural disposition; but to eat *as long as* we are hungry, may not always be prudent. Since the feeling of hunger does not depend so much upon the state of fulness or emptiness of the stomach, as upon the condition of the general system, it appears evident that the ingestion of food cannot *at once* produce the effect of dissipating it, though it will do so after a short time; so that, if we eat with undue rapidity, we may continue swallowing food long after we have taken as much as will really be required for the wants of the system; and every superfluous particle is not merely useless, but injurious." These observations apply equally well to horses as they do to ourselves. (2) Appetite guides the animal in the selection of food suitable for the repair of the waste that is going on at the time. As a general rule, when a horse's powers are fully taxed, he should be allowed as much corn and hay as he chooses to eat, provided always they are both of a suitable nature. The instinctive selection of food is well seen in the case of men who have to work hard, such as navvies and sailors; for they will eat, with benefit, a quantity of animal food and fat, from which a sedentary person will turn with loathing.

INFLUENCE OF AN ARTIFICIAL STATE OF LIFE.—The horse is intended by Nature to travel considerable distances when grazing; and his natural food is one of large bulk, and containing a comparatively small amount of nourishment; his digestive organs being specially adapted for its consumption. The requirements of civilisation, however, interfere most materially with these conditions. At times, long protracted rest deprives the animal of the exercise which is essential to his health, and which he, in a state of nature, would be obliged to take in the pursuit of food. On the other hand, in order to develop his physical system to its utmost extent, he is supplied with forage of a far more concentrated form than he was naturally intended to consume. Hence, being unable to trust to the animal's appetite alone as a sure guide in the selection of food, in all cases we must regulate it according to the indications afforded us by the study of the anatomy and functions of his system.

PREPARATION OF FOOD.—Oats, gram, Indian corn, barley, wheat, and rice in husk (Hind. *dhan*) should be bruised or broken before being given to the horse, in order to oblige him to masticate them properly, so that the grain may become thoroughly saturated with saliva. If given in a whole state, it is liable to be swallowed as soon as its outer surface becomes moistened.

Heat, whether by the process of boiling or parching, causes the grains of starch in corn to burst, and the albumen to coagulate, so that the different digestive fluids are then able to penetrate easily through its substance. The objection to boiling is that it causes the food to become saturated with water, which decreases its digestibility, and greatly increases its bulk. Parching, however, is free from any such drawback, and may be advantageously applied to the preparation of barley and wheat. The husk of the first-mentioned grain often has a more or less irritating effect on the intestines of the horse. The process of parching not alone renders the grain porous, but also deprives the husk of its objectionable properties. The husk of linseed, *kúltbee*, and *úrud* is so hard that they require to be boiled before being given.

CHAPTER V

ON WATERING HORSES

THE blood being the source from which the different tissues obtain materials for repair and development, and the vehicle which conveys away the effete products resulting from the constant waste that goes on in the animal economy, the whole question of nutrition depends on supplying the system with materials suitable for preserving that fluid in a normal and healthy condition.

The proportion of water in the blood is about 750 parts in 1,000; the variation being dependent on the nature of the animal's work, food, state of health, etc. Its presence is essential to the performance of the various functions. If its supply be curtailed, the secretions that are indispensable to the process of digestion are checked either wholly or in part; because the glands are unable to obtain a sufficiency of water from the blood. If, on the contrary, more water be drunk than is needed for the requirements of the system, the excess is quickly eliminated by the kidneys, skin and lungs, without doing any harm. We may conclude, therefore, that a full supply of water, given a short time before feeding, is essential for the proper digestion of food.

The office of the sensation of thirst is to cause the animal to desire to drink water, when there is a deficiency of that fluid in his blood.

The stomach is furnished with a vast number of blood vessels, the office of which is to absorb water for the supply of the glands that secrete the gastric juice. As the amount of the secretion necessary for digestion varies from 10 to 20 gallons daily (according to Brinton), and as about 99 per cent. of it is composed of water, we find that the process of digestion during the day demands the outpouring, for the formation of gastric juice, of double or treble as much water as there is blood in the whole body. Now, as this water is derived directly from the blood, its adequate supply can only be obtained by the constant reabsorption in the stomach of the watery portion of the effete gastric juice, as well as of that of other fluids which may be present. Considering the enormous quantity of water required for the secretion of the gastric juice, we may accept the fact that drinking a small quantity of water with the food is not only free from objection, but may be actually beneficial. On this point we may safely trust to the instinct of the animal, and may consequently leave a supply of water before him while he is eating; provided always that he has had a full opportunity of drinking shortly before being fed.

If, as we have seen in the preceding chapter, while digestion is going on, a large amount of water be taken into the stomach, it will dilute the gastric juice to an extent that will probably arrest its action until the excess of water becomes absorbed. During this interval, decomposition of the food, with consequent derangement of the digestion, may ensue; followed, perhaps, by colic, or even by rupture of the stomach, owing to the pressure exerted by the evolved gas. Hence, we may conclude that the horse should be watered *before* being fed. But if, as in case of want of time, this precaution has not been observed, only small quantities, with reasonable intervals to allow of its absorption, should be allowed; say 10 "go downs" at intervals of five minutes, assuming 20 "go downs" to the gallon. Considering the quickness with which a horse digests his food, I think we may assume that he may be watered 2½ hours after being fed, without any ill consequences. The reason that soft is better than hard water for horses—a fact known to every careful stableman—is that the freer this fluid is of impurities which possess astringent properties, the more readily will it become absorbed into the blood.

Respecting the celerity with which water is assimilated, I cannot do better than quote the following extract from Seller and Stephens' *Physiology of the Farm*: "That water passes with extreme rapidity from the stomach of the horse, as from that of mammals in general, is apparent from the well-known fact that a horse will drink within a few minutes a much greater quantity than his stomach can contain. It is commonly supposed that the excess passes at once into the highest parts of the small intestines, namely, the duodenum. But this supposition is hardly necessary, for it is proved that absorption of thin fluids takes place from the inner surface of the stomach with an almost incredible rapidity. The fact is established by many experiments; and, moreover, that substances dissolved in the water taken in have been found in the urine within an incredibly brief period." The obvious lesson these considerations teach us is that we should not be chary in allowing a horse to drink when he wants to do so, except indeed after feeding.

One of the popular errors about watering horses is that they should be stinted of water for several hours before doing fast work, on the plea that it affects their wind. As the water which becomes part and parcel of the blood cannot by any possibility impede the organs of breathing, it follows that its unabsorbed portion alone can affect them; but we have just seen that the whole of the water is taken up with extreme rapidity, so that, after a short time, there is none left in the stomach or intestines to cause any impediment. On the contrary, stinting a horse with water will directly affect his wind, for the blood will then gradually become thickened, and, if the animal be put to violent exertion, will fail to circulate through the lungs with requisite freedom; besides that, the action of the heart will become impeded, and the nutrition of the system more or less arrested.

If a horse has been deprived of water for a considerable time, we should exercise some caution in watering him, lest he may drink a larger quantity than can readily be taken up; for the unabsorbed portion—especially if the fluid be given cold—may cause serious derangement. When a horse is heated by exercise, his system will absorb water far more readily than when he is cool; hence, under the former condition, there is far less risk in giving a liberal supply than under the latter, always supposing that the water is not very cold: in which case there would be danger of injury from nervous shock. General Sir F. Fitzwygram remarks: "It is a somewhat singular fact that horses may be watered with safety almost immediately after their return from work, even though somewhat heated." And he points out that there is then far less risk of chill from such horses drinking cold water, than when the system has begun to flag, and that, in the latter case, the water should be made slightly tepid, or a bucket of gruel should be substituted for it. As the application of cold causes contraction of the muscular coats of the blood vessels, so does it retard the absorption of water which is taken into the stomach.

When a horse goes through violent and continued exertion without drinking, the amount of water in his blood falls below its normal quantity. If this loss is considerable, the thickened blood, as already stated, will be unable to circulate freely through the lungs, and the action of the heart will become laboured in its efforts to pump this abnormally dense fluid through the system. If a horse in this state be given, say, a couple of gallons of water, they will be absorbed at once into the blood, and will restore it, more or less completely, to its normal fluidity; the action of the lungs and heart will be almost instantaneously relieved, and the feelings of distress will rapidly subside. Had the water, on the contrary, been withheld until the horse had cooled down, the prolonged distress would undoubtedly have injuriously affected the animal's condition and spirits. I have adopted, with the best results, the practice of giving half a bucket of water to racehorses I have had in training, immediately after their gallops.

Persons who have had to ride long distances in hot countries, are well aware of the advisability of allowing their mounts to drink frequently during a journey of any good water near which they may pass, even when the horse is bathed in perspiration.

In Northern India the *ecka* (a small two-wheeled trap) ponies, which average about 13 hands 1 inch in height, frequently travel fifty to sixty miles a day over unmetalled roads during the hottest weather, when the noontide heat often exceeds 115° in the shade. Such performances can only be accomplished by watering the ponies every 7 or 8 miles: the system pursued being that they get at each bait from 1 to 2 lbs. of *suttoo* mixed in a couple of quarts of water. This is in accordance with the practice—generally adopted by stokers and firemen on board steamers—of mixing oatmeal with the water they drink; a practice from which these men, who are often exposed to intense heat, and who are consequently obliged at such times to drink large quantities of water, experience great advantage.

In the stable, I think the best system is to allow a constant supply of water; a plan which is not alone beneficial to "washy" horses that scour easily, to roarers, and to broken-winded animals, but also is particularly well calculated to prevent and to cure the pernicious habits of crib-biting and wind-sucking.

CHAPTER VI

PRACTICAL RULES FOR FEEDING AND WATERING HORSES

FROM the theoretical considerations detailed in the two preceding chapters, and from the results of experience, we may draw the following conclusions:

1. The horse's corn should be given dry, except when the grain—such as linseed, *kúlthee*, etc.—is too hard, in its natural condition, to be properly masticated; when, from old age and other causes, the animal's powers of chewing are impaired, and when the appetite has to be humoured in sickness.

The only way I can account for the Indian practice—now happily falling into disuse—of steeping gram in water before giving it to the horse, is that it is done with the idea of causing the gram to swell as much as possible before entering the stomach, in order that it may not do so after arriving there, especially if the animal be subsequently supplied with water. Those who adopt such a precaution entirely ignore the fact that it is the evolution of gas—resulting from the decomposition of the food—which produces flatulent colic and rupture of the stomach, and not any swelling of the gram, which, if it be given dry—as we have previously seen—will become saturated with a greater quantity of saliva than that of its own bulk before it even reaches the stomach. The danger of a horse choking himself—if the stableman takes the most ordinary precautions—is purely imaginary.

2. The different grains, before being given to the horse, may be prepared as follows: Oats and wheat, bruised. Gram, Indian corn, and rice in husk, roughly broken. Barley, parched and roughly broken. If the parching be dispensed with, barley should at first be cautiously given to the animal, so that it may not "scour" him.

3. The following forms a list of Indian foods, calculated to maximum amounts:

		lbs.
1.	Gram or kúlthee	10
2.	Gram	7
	Bran	5
3.	Barley	16
4.	Barley	5½
	Gram	7
5.	Oats	20
6.	Oats	14
	Gram, kúlthee, or úrud	5
7.	Indian corn (p. 88)	10
	Bran	10
8.	Indian corn	10
	Gram	5
9.	Indian corn	6
	Gram	5
	Bran	4
10.	Gram	3½
	Barley (parched)	4
	Indian corn	5
	Bran	4
11.	Oats	6
	Gram	5
	Bran	2
	Linseed	1
12.	Gram	6
	Rice, in husk	10
13.	Gram	5
	Rice, in husk	8
	Bran	4
14.	Wheat	8
	Chaff, a sufficiency, say	4
15.	Wheat	4
	Gram	7
16.	Wheat	4
	Indian corn	4
	Bran	4
	Gram	4
17.	Mote	6
	Gram	6

I have assumed Indian oats to contain about a quarter less nutriment than English corn.

Bearing in mind the difficulty there often is in procuring certain grains in many parts of India, I have varied the proportions so as to suit horse owners who have but a limited supply of particular grains; such as oats, for instance.

The reader may rely on these foods being suitable in practice, as well as correct in theory. Nos. 5, 6, 8, 10 and 11 are those I would specially recommend. No. 5 is the best for ordinary animals; No. 6, hard-worked horses, such as those used in racing; No. 11, for similar animals when low in condition. The other two can almost always be procured, and usually at a cheap rate. The amounts are intended for a full-sized Australian or English horse. During ordinary work we may give from two-thirds to three-fourths of them. One-half will be sufficient during idleness.

4. A 13-hand pony will eat about half as much as a large horse. An Arab will, as a rule, require about 4 lbs. less than a full-sized Australian or English horse.

5. The amount of grain given to the animal should be proportionate to the work he is called upon to perform, remembering always that there is a constant waste of tissue going on which demands repair by food.

6. When a horse is comparatively idle his food may consist of one-third to one-half of bran, and two-thirds to one-half of oats, Indian corn, barley, or *paddy*—in preference to gram or *kúlthee*—say 8 or 10 lbs. altogether. The same practice may, with advantage, be observed during the hot weather.

7. Horses should not be allowed to run down in condition, even when out of work; for, especially in

India, it takes a long time to put flesh on them again.

8. When a horse's powers are fully taxed, he should get as much *suitable* corn as he may choose to eat.

9. The corn should not be given in such quantities as will cause irritation of the intestines, which will be evinced by a loose and sticky condition of the dung, which should, on the contrary, be well formed, brittle, and devoid of bad smell. When gram and *kúlthee* alone are used, these conditions cannot be properly complied with. When diarrhœa is thus set up, it is the result of an effort of the system to expel an excess of nutritive matter, which is deleterious to the health. In such cases, withdrawal of the corn, dry bran and, maybe, a mild purgative, are indicated.

10. When the amount of grain is limited, say to 8 or 9 lbs., and when the animal has to do hard work, either gram or *kúlthee* is more suitable than other grains that contain less nitrogen.

11. Foods rich in fat and sugar, such as linseed, Indian corn, milk, *goor*, etc., are the best for putting a lean horse into lusty condition.

12. Horses that get a full amount of corn should, as a rule, have a fair supply of carrots, lucern, or green grass (preferably, Hind., *doob*), which will tend to remove any irritation of the intestines caused by the grain.

13. In cold weather, if horses be not warmly clad they should have an increased amount of corn.

14. A horse should have a constant supply of salt,

say 2 ozs. daily; or he may be allowed a lump of rock-salt in his stall.

15. If boiled food be used, salt should be mixed with it before giving it to the horse.

16. A horse's corn should be given at frequent and regular intervals. Say as follows, supposing 9 lbs. to be the daily amount :

5	a.m.	1 lb.
8.30	„	2 lbs.
12.30	p.m.	2 „
4	„	1 lb.
8	„	3 lbs.
	Total	9 „

17. When the animal's powers of digestion are impaired, spices or condiments may be given in order to stimulate the system to take up an increased amount of nutriment from the food. Such articles have little or no dietetic value of their own.

18. In order to induce the horse to eat slowly, it is desirable to feed him from a broad box, or trough, placed not much above the level of the ground. The corn may be spread out in a thin layer on the bottom of the box.

19. Greedy feeders may have a quantity of chopped hay mixed through their corn.

20. A horse should not be worked for at least an hour and a half after feeding.

21. A horse should always have a supply of hay or dried grass before him while he is eating his corn, so that, by inducing him to vary his food, he may not consume it in too concentrated a form.

22. Horses that are inclined to "scour" should have some hay given to them before they get their corn.

23. Unless in cases of enforced idleness, depraved appetite, etc., a horse should have as much hay or dried grass as he may choose to eat.

24. If procurable, the grass which is called *doob* in Bengal, and *hurryalee* in Madras, should be used in preference to all other kinds. It ought to be dried a day or two in the sun before being given.

25. If possible, a horse should get daily at least 2 or 3 lbs. of green food, such as lucern, carrots, etc., as the time of the year may permit.

26. On a journey, a horse should be baited about every two hours, giving him, say, a gallon or two of water—if he chooses to drink it—followed by about 2 lbs. of corn, with a little grass each time; or he may get a couple of pounds of *suttoo* mixed in his water, and a little grass after it. The hotter the weather and the harder the work, the more frequent should be the baits. If he be given a larger feed than 2lbs. of corn, he should be rested for at least an hour, or he will be apt to tire quickly and be inclined to scour. *Suttoo* and water is the best bait when the halts are of short duration.

27. On long journeys, a horse should be allowed to drink very frequently—in fact, whenever he wants to do so. Taking an immoderate amount of water at one time should of course be guarded against.

28. Some horses are inclined to purge if they be put to work soon after being fed or watered. If the services of such animals be required in the morning

they should get neither corn nor water until after their work.

29. The best plan regarding the water of horses in the stable is to allow them a constant supply of it in their stalls.

30. If this cannot be done, they ought to be watered *before* each feed, or at least three times a day in cold weather, and four times in hot.

31. Immediately after violent exertion, a horse should have a moderate amount of water to drink—say, one gallon—and, if he be thirsty, another gallon five or six minutes later.

32. However hot and perspiring a horse may be, he should get this water *at once, before he cools down*; but if he cannot get it until he is cool, he should be given a smaller amount, and some more at intervals of five minutes or so.

33. The "chill" need not be taken off water except when the horse is very thirsty, and the water unusually cold.

34. Soft water is generally considered preferable to hard, although I have not known any bad results accrue to horses in India from the use of well water that was good for human consumption. The hard water of some limestone districts in England, being loaded with mineral matter, is apt to cause colic when taken cold and in large quantities, especially when the stomach is full or weakened by long fasting. I prefer well water in India to that obtained from rivers. Water from swamps or stagnant pools should not be used (*p.* 57).

CHAPTER VII

GROOMING AND STABLE ROUTINE

On the theory of grooming—Washing the horse—Clipping—Grooming—Dressing the mane and tail—Tapeeing—Shedding the coat—Care of the feet and legs—Trimming the mane and tail—Bots—Stable routine.

ON THE THEORY OF GROOMING.—The skin of the horse is composed of two layers. The inner layer, or true skin, is tough and elastic, and is provided with nerves and blood vessels. In it exist vast numbers of narrow, minute depressions—hair-follicles—from which arises the hair that covers the body, and also an innumerable number of sweat-glands and oil-glands, both of which possess minute tubes that convey their respective secretions to the surface. The oil-glands are specially connected with the hair, as their tubes open either into the hair-follicles or close to the hairs. The action of the oil is to keep the skin and hair soft and pliable, and also to protect the skin from chill; while that of the watery fluid is chiefly employed in carrying off, by evaporation, any excess of heat beyond the standard temperature of health. The sweat of the horse is composed of a mixture of these two secretions, the former giving it a greasy character when he is fat, the preponderance of the latter a watery appearance when he is in poor condition, or when "drawn fine." The effect of friction applied to the skin is to draw to the surface an increased amount of blood, from which the glands in question obtain materials for forming their respective fluids.

The inner layer, or true skin, produces the outer skin, which consists of scales, more or less glued together, according to their distance from the surface. This outer skin lines the openings of the oil and sweat tubes, and surrounds each hair. Its presence affords protection to the skin, and checks the outpouring of the oil and perspiration. Hence, when horses are turned out in the open without adequate clothing, they should on no account be groomed, which process is intended to remove as much of the outer or scarf-skin as possible, and, by friction, to stimulate the secretion of oil and perspiration. The oil protects the skin from the injurious action of water, and also assists in maintaining the internal temperature of the body by rendering the coat bright and glossy—a condition that checks the radiation as well as the absorption of heat. Consequently, a horse with a polished skin will not be as liable to be chilled by wet or cold, nor to be as unduly heated by the rays of the sun, as he would be were his coat dull. This immunity, however, will only last for a few hours, or until the weather affects the hair.

The skin acts as an assistant to the lungs in giving off carbonic acid gas, and thus aids in purifying the blood. The cold produced by the evaporation of perspiration materially assists in lowering the temperature of the body to its normal degree when it has been raised beyond it by exercise. Hence the necessity of the free secretion of perspiration by the skin of hard-worked horses.

Apart from the foregoing considerations, we may see that the fact of the skin being in a healthy state will tend to induce a like condition of the stomach, intestines, and air passages; for the skin is continuous with the mucous membranes which line these organs. Owing therefore to the close relationship which exists between the various portions of these respective surfaces, we find that, in cases of derangement of the stomach, etc., the coat becomes dull and unthrifty. In like manner, a return to health will be marked by an improvement in the state of the skin, affections of which are more or less followed by an impaired condition of the digestive apparatus. Experience, as well as physiology, teaches us that the stabled horse's general well-being is greatly dependent on his skin being clean, well polished, and healthy.

From these considerations, we may readily see how important the process of grooming is to the maintenance of high condition in the horse.

I may briefly sum up the objects sought to be obtained by good grooming as follows: (1) to remove the scaly part of the outer skin in order to allow of ready exit to the fluids that flow from the oil-and sweat-glands; (2) to stimulate by friction these glands to increased activity; (3) to determine blood to the surface of the body, so as to relieve the internal organs;

(4) to remove all superfluous hair, the presence of which would tend to check evaporation from the skin; (5) to induce a healthy state of the skin itself, in which the mucous membranes of the digestive and respiratory organs will tend to participate.

The skin of the well-groomed horse will be in the best possible condition to play its allotted part when the system is called upon to perform violent exertion, but not to resist the continued effect of cold during a state of inactivity. Hence, such an animal should, when he is at rest, be provided with an adequate supply of warm clothing, to make up for the loss of the protection which was afforded by the scaly part of the outer skin, and by the increased amount of hair possessed by him in an ungroomed condition.

Washing the Horse.—This practice is, as a rule, injurious; for it not alone removes the natural oil from the skin, thereby rendering the coat dull, but is also apt to produce chill, which is the fruitful source of many equine ailments. In a warm atmosphere, a horse that is heated and perspiring can take no harm from being washed, provided he is quickly dried. Owing, however, to the large surface of the body and the presence of hair over it, it is difficult to dry a horse thoroughly in time to prevent the chance of his catching cold, and then to apply sufficient friction to stimulate the oil-glands to renew the gloss his coat lost from the washing. If it is imperative to wash, and there is not sufficient assistance to have the animal rubbed dry without loss of time, we may, after scraping and rubbing him over, put on a good supply of warm clothing, bandage his legs, and leave him thus to dry under his rugs, which he will do in an hour or less. He should, after that, he exercised or warmly stabled, so as to prevent him becoming chilled.

Water has no power to remove the scaly part of the outer skin, its effect being confined alone to any dust or mud that may have fallen on the coat. Our best authorities are unanimous in condemning the custom of washing the animal. Both cracked heels and mud fever—a form of inflammation of the skin, which extends more or less over the legs, and sometimes over the lower surface of the belly or abdomen—are often caused by this practice. Mud-fever is a common complaint in England, though rare in India.

We find from experience that the external application of warm water, especially to the legs and feet, is still more objectionable than that of cold. This is chiefly due to the fact that it more readily removes the oil which keeps the skin soft, and is more efficient in loosening the layers of scales which serve to protect the true skin from irritation by external objects. The heat of the warm water may also stimulate the oil-glands, which lie deep in the true skin, to an abnormal degree of activity. Subsequent cold, brought on by evaporation or by a current of air, may cause contraction of the superficial extremities of the oil-tubes, so that the exit of the fluid may become obstructed—a state that will probably be followed by inflammation, as may be evinced by "cracked heels," "grease," or "mud fever."

Clipping.—The presence of a thick covering of hair is analogous, in the case of a man, to the wearing of a warm overcoat, which, however suitable it would be to protect the body while in a state of comparative rest from the inclemency of the weather, would be a distressing burden to one who had to undergo severe muscular exertion. Applying the simile of a man taking off his great-coat when he has to, say, run, row, or cycle, and putting it on so as to avoid the ill effects of chill when the exercise is at an end, we may see how reasonable it is to have hard-worked horses clipped, and to protect their systems by adequate clothing as soon as they have cooled down. If a horse is not at work, there is no necessity for clipping him, unless the presence of long hair distresses him. I have frequently noticed in India that the mere fact of clipping a horse caused a marked improvement in his condition. As the seasons of the year in the Antipodes are the reverse of those in countries north of the equator, newly imported Australasian horses will, unless relieved of it, carry, during the hot weather, an abnormally long coat, which should be clipped off as occasion demands. Such animals cannot be considered to have become acclimatised until the functions of their skin have accommodated themselves to the conditions under which they are called upon to act.

"With reference to the clipping of horses, I am of opinion that it is a great advantage. They work better after being clipped; thrive on less food; are less liable to disease; are stronger, healthier, and more cheerful; and, when sick, recover in a much shorter time. It is not my intention to discuss the question;

I merely wish to counteract a ridiculous idea propounded by Mr. Gamgee, that clipping is injurious to the horse.

"I strongly recommend the Irish method of clipping, namely, clipping all parts of the body except the legs. The hair that is left on the legs protects them from the irritation of wet and dirt, and, when horses are used for hunting purposes, from the penetration of thorns, etc." (Williams.)

Horses in India that are thoroughly groomed, well fed, and warmly clothed, will rarely have a coat long enough to require clipping.

As the bristles that grow about a horse's muzzle, eyes and chin, act as feelers—replacing to some extent the want of hands—they should not be cut or pulled out. The hair which lines the external ear should also be allowed to remain untouched.

Grooming.—Before grooming, the horse may be tied up by side reins running from rings fixed about 6 ft. high at each side of the doorway of the stall, and attached to the rings of the watering bridle.

If he kicks badly, his hind legs may be confined by a short hobble (called in Hindustanee, *mujuma*) placed on his hind pasterns. The use of heel-ropes is apt to strain him.

When the horse returns from exercise in clothing, he should be tied up, his hood removed, and his neck and throat scraped if there be any sweat visible.

The space between his jaws should be carefully dried with a dry cotton rubber. A man on each side, with a fresh straw or hemp wisp, should go thoroughly over the exposed parts, working the wisp backwards and forwards well into his coat. The breast and body pieces are successively removed, and his chest, fore-arms, shoulders, back, loins, belly, quarters, thighs, etc., quickly rubbed down and dried in a similar manner. This done, the syces should set to and hand-rub him, beginning at his ears and ending at his hocks. The ears should be pulled gently between the fingers several times—a process that always seems to refresh the animal. When hand-rubbing, the stroke should be commenced by bringing the flat of the hand—each one to be used alternately—well under the belly, down the fore-hand, thigh, or gaskin, or between the fore-legs, as the case may be, and it should then be drawn up with a steady pressure. As the hand is raised, the elbow should be turned out, and the under part of the bared forearm should be brought into play against the grain of the coat. In doing this the weight of the body and strength of the arm should be utilised.

With a valuable horse, one should put two men on the legs, and two on the rest of the body. The quicker the hand-rubbing is done, the more effectual will it prove.

On an average, the wisping down will take about ten minutes; the hand-rubbing somewhat longer.

If only two men be available, the legs below the knees and hocks should be left untouched until a later period of the grooming.

The hand-rubbing being finished, a syce on each side should go over the coat with the body brush, for the cleaning of which only should the curry-comb be employed.

The brush should have long and rather soft bristles, and should be used only in the direction in which the hair lies, and not against it; as, with the grain, it will most effectually remove the dandruff, which is thrown off by the skin in the form of scales that are pierced by the hairs. The syce should place the brush lightly on the coat, so as to avoid hurting the skin, and should then press on it, as he makes his stroke downwards.

The chief object of brushing the coat is to remove the scaly dandruff; that of wisping and hand-rubbing, to dry and stimulate it.

English trainers usually teach their stable lads to make on their horses' quarters, when the grooming is finished, "quarter marks," of which the most common is the "diamond." This mark is made by brushing the quarter with the body brush, from front to rear, in the direction the hair lies; then drawing a stroke with the brush down the centre of the quarter, in a perpendicular direction, so as to ruffle the hair; and, finally, smoothening, with the brush, the upper and lower portion of the quarter, so as to leave a "diamond," or rather a rhombus, of, say, about 4 in. wide. The rough hair of the quarter mark will, naturally, enhance by contrast the brilliancy of the remainder of the coat of that part. The pattern may be varied at pleasure. Some trainers affect one, some another kind of distinctive mark; while others pay no attention to them.

DRESSING THE MANE AND TAIL.—The brushing of the body being finished, the syce should brush out the forelock, mane and tail, taking care, first of all, to commence at the ends of the hair, and to proceed upwards as each kink or knot becomes opened out. The hairs, by small locks at a time, should be brushed from their roots downwards, so as to remove all dandruff. The mane-comb should be used only when it is desired to keep the mane or tail thin.

It is the custom to make the mane lie to the off side; for, as we usually look at a horse from the near side, his neck and shoulders—if they be good—will then appear to greater advantage than if the lines were broken by the mane.

The off horse of a carriage pair may have his mane groomed to the near side.

Wetting the hair of the mane and tail will tend to make it grow fast.

If the mane does not hang properly down, it may be daily wetted and plaited, while small weights may be attached to its ends. A thick paste of flour and water plastered over the mane and tied down with a cloth, will make the hair lie flat in a few days. The paste should be allowed to remain on during the day, if the animal's services are not required.

If a horse be inclined to rub his tail against the walls of the stable, a light leather sheath, to lace on, may with advantage be used to protect the part. In such a case, the cause should be removed by appropriate medicinal treatment.*

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* *Veterinary Notes for Horse-Owners*, by the same author.

Some syces have a habit of washing horses' tails by means of a wet towel, which they rub with and against the grain of the hair. This practice should not be allowed, as it breaks the hair, and disarranges its set, thereby disfiguring the animal.

After the mane and tail have been adjusted, the syce should wipe out the horse's eyes, nostrils, sheath, and dock with different damp towels or sponges, and then smooth down the coat with a dry wash-leather or cotton rubber. After this, the clothing is put on, care being taken to throw the quarter-piece a little way in front of the withers, and then to draw it back, so that the coat may not be ruffled.

The feet should then be picked out and cleaned with a dry brush and rubber, the legs hand-rubbed, and bandages put on, if they be employed. If bandages be used during exercise, they should be allowed to remain on until the syce proceeds to hand-rub the legs.

The foregoing completes the description of ordinary grooming, to which the following process may be added with advantage.

Tapeeing.—This Indian practice is a form of massage which is known in England and France as *tapotement* (percussion). In India it is done with broad circular pads, called *tapees*, each one of which is about 9 in. in diameter and 3 in. thick. They are stuffed with horsehair, and are covered with leather. A strap is placed at the back of this pad to admit the hand placed flatwise. They are used one on each hand, and are brought down in quick succession, with the whole force of the arm, on the spot intended to be shampooed. The neck, shoulders, barrel, and hind-quarters are thus gone over by a syce on each side of the animal. The loins and flanks are avoided. The usual method is to strike first with the left hand, then with the right, and again with the left, and then to bring the pads sharply together so as to knock out the dust. Tapeeing has an excellent effect on the skin and coat, and is much relished by the horse when he gets accustomed to it. If put into practice, it should be performed immediately after the animal is brushed down.

In all cases, when there is sufficient help and time, the grooming should be such as I have described in the foregoing pages.

When a horse comes in heated, and there is only one man to attend to him, the girths, if a saddle be on, should be slackened, and he should be walked about until he cools down, and then the wisp should be applied, beginning first of all at the part under the saddle.

I have never found the slightest ill-effect accrue from removing the saddle immediately the horse comes in, however heated he might be, provided always the skin under it was thoroughly well dried without delay.

SHEDDING THE COAT.—The horse sheds his coat twice in the year—in the autumn and in the spring. At the former time, his fine summer hair falls out, to be replaced by a thicker and longer covering, which, in its turn, gives place to the other. If, while the coat is changing in the spring, the brush, or other means be employed to hasten the process, the hair-follicles will become prematurely exposed to the action of the air, and, consequently, will become stimulated to produce a coarser form of hair than they would have done had their natural protection remained on for its allotted period. Hence, the new summer coat will be rougher than it ought to be, and its appearance will, consequently, be more or less spoiled. On this account, when the coat is being shed during that time, the brush should not be applied to it, nor should it be hand-rubbed. The wisp and rubber will then be sufficient for grooming purposes.

In India, the shedding of the coat of horses that are well groomed and warmly clothed takes place to a far less extent than in England.

CARE OF THE FEET AND LEGS.—The horse's feet should neither be washed nor "stopped", for the former practice is the fruitful cause of "cracked heels" and the latter induces thrush, and softens and weakens the sole, frog, and crust. The old ideas of "thinning" the sole, and keeping the feet soft by stoppings of cow dung and clay, are antiquated fallacies that hardly require being combated in the present day. In India, especially, we require the feet to be as hard and tough as possible, so that the horse may neither flinch, nor go short over hard or broken ground, nor become lame if he casts a shoe and has to proceed for a few miles bare-foot. Water applied to the feet renders them soft and weak, on account of the capillary attraction exerted by the fibres of the horn on any liquid with which it may come in contact. It is a significant fact that the drier the climate in which horses are bred and reared, the stronger and better able to stand work are their feet.

No benefit is obtained by applying hoof ointment to the crust, unless, perhaps, to those parts from which the hard and varnished covering of the wall may have been rasped away by a careless or ignorant shoeing-smith. The growth of the wall of the hoof can alone be hastened by stimulating the coronet which secretes it; hence, any hoof ointment, used as such, is powerless to effect this end.

Although the employment of greasy applications may have a temporary effect in tending to render dry horn tough, still, their constant use will, as a rule, cause the feet to become more brittle than they were before, if, by any chance, these dressings are discontinued. They should, therefore, not be employed with horses like those in the Army, that may be sent on work, the circumstances of which may prevent the use of such applications.

In this chapter I have already dwelt upon the evils of washing the legs of the horse, hence I need not further allude to the subject beyond saying that if the animal returns to the stable with his legs wet, or covered with mud, they should be dried by means of the scraper, wisp and rubber, as the case may be, and hand-rubbed when dry.

One should avoid hand-rubbing the legs when they are wet, as doing so will tend to remove the hair.

Hand-rubbing the legs is a beneficial practice with the generality of stabled horses. It tends to prevent stagnation of blood in the legs and feet; by the pressure exerted, it promotes the absorption of any effusions that may be present about the back tendons and suspensory ligaments, and it helps to guard the horse against that form of inflammation called "cracked heels" and "mud fever."

TRIMMING THE MANE AND TAIL.—The mane may be trimmed by pulling out the longest locks, a little at a time, having previously twisted them round the forefinger or a stick. If this annoys the horse, the long ends may be divided by running a half-shut scissors backwards and forwards across them, in the same manner as hairdressers trim ladies' hair. The ends are held in the left hand, while the right uses the scissors.

A space of about an inch and a half broad should be cut out of the mane, just behind the ears, for the passage of the head-stall of the bridle.

When hogging the mane of a pony, it is customary, in order to help the rider in mounting, to leave a lock of hair. This, to be effective, should be about half-way up the neck. The easiest and neatest way to hog the mane is to cut it close, running the clipping machine along the top of the crest, and then on each side, so as to make the hair level. The old plan of hogging the mane, so as to leave a bristling ridge of hair, is tedious in execution and has a bad effect, in that, instead of preserving the natural outline of the neck, it gives the part an abnormally thick and high-crested appearance.

A switch tail may be trimmed in the same manner as the mane.

It is not the fashion to bang the tails of Arabs; a fine, thin tail being considered to be a mark of high caste among them.

Horses' tails ought not to be shortened after the beginning of April, as their powers then will become fully taxed in keeping off flies. They should not be again trimmed before the month of October.

The object of banging a horse's tail is to add to the appearance of strength in his hind-quarters. The usual length at which a horse's tail is banged is such that will enable the end of the tail, when pulled down, to reach the point of the hock. The more "cobby" the animal, the shorter may be the bang.

The following are three methods for banging the tail:

1. Get an assistant to place his hand under the dock and to hold the tail in a position similar to that which it would assume were the animal walking; then, with a strong pair of scissors, cut the hair level at the desired length.

2. Bind the tail round with a piece of cord, about 6 in. above the point at which it is to be divided; then, with a sharp knife, cut so as to give the ends of the hair the required slope.

3. Lay the tail, at the desired length, across the edge of a broad adze (Hind. *busoola*), and divide the hair by a smart blow with a flat billet of wood. The adze should be held steady, the handle to the rear, the edge horizontal, and the blade sloped, so that the horse may carry his tail level at a walk. Any loose hairs may then be trimmed with the scissors. This is a

good plan for "troopers," with which dispatch and uniformity are matters of consideration. For use with a number of horses, a blade resembling that of an adze, but broader, may be let into a block of wood 4 or 5 lbs. in weight.

BOTS.—During the autumn months, the bot-fly will endeavour to lay its eggs on the chest and fore-legs of horses, especially if the animals be kept much in the open, as when on the march. These eggs adhere to the hair, and, though very minute, may readily be recognised by their bright yellow colour, and by their position, which is chosen by the fly so that the horse may easily lick them off, and thus convey them into his stomach. During these months, syces should be careful to examine their horses after they come in from exercise, and pick off any eggs they may detect.

STABLE ROUTINE.—The system which is applicable to racehorses should be the one pursued with all valuable animals, under the modifications that necessity or convenience may require. I may describe it as follows:

At daybreak, the horse is given about half a gallon of water, and after that a feed of about a pound of corn; his clothing is taken off, and he is groomed lightly over. The whole of the bedding should now be put outside, to be aired and dried, and the dung and fouled litter should be removed. The stable should be opened out to admit air and sunshine. The floor should be well swept, and any portion of it which may have become wet with urine should, if the floor be of waterproof material, be strewn over with dry earth, and then swept dry and clean with a broom. If the floor be of earth, the soiled parts should be scraped up and replaced by dry soil. On the horse's return from work or exercise, say about 8 or 9 o'clock, he is watered, groomed, and clothed according to the season. His bedding is now neatly put down; and he is fed, and given a full allowance of grass or hay, at the same time as he gets his corn. The stable is then darkened, and the animal is left to himself for three or four hours. Between twelve and one he is watered, lightly groomed, and fed as before, and is not again disturbed until about four o'clock, at which time he gets a little water, a small feed of corn, and a thorough grooming. The bedding should again be removed, dried, and selected. On the horse's return to the stable in the evening, he is watered and lightly groomed over. His bedding is now arranged, he is fed, given his grass or hay, clothed, and left for the night.

The syce should remove without delay all dung, urine, and soiled litter from the stall; for the presence of dirt is not alone injurious to the horse's health, but it also attracts flies, which are extremely annoying to the animal, especially during the hot weather.

Strict supervision must be exercised in order to prevent syces taking the clothing off their horses on cold nights, and using it themselves for bedding.

For hours of feeding and division of food, see page 100.

Instead of watering the horse at fixed times, he may, with great advantage, have a constant supply of water at all times in his stall.

It is better to have horses groomed in the afternoon than in the evening, for then the syces will have plenty of light by which to do their work, and the owner will probably be able to superintend it, to some extent at least, without its interfering with his dinner.

To economise the bedding, it may be put down only at night.

I strongly advocate the system of feeding which I have described.

CHAPTER VIII

MANAGEMENT OF HORSES ON BOARD SHIP

I SHALL confine my remarks to the transport of single horses on board ship.

The frogs and soles of a horse's feet, before he is embarked, should be hard, strong, and as fully developed as possible. Hence, it is advisable to let him go barefoot for a couple of months beforehand, or to shoe him *à la Charlier*, or with tips, while the crust and heels are kept low, and to forbid all paring of the soles and frogs with the drawing knife, as well as "stopping" with cow-dung, etc. If thrush be present, the animal's feet should be treated for it without delay. Shortly before being put on board, the shoes (if they be used) should be taken off, and the heels and walls of the hoofs should again be lowered, so as to obtain frog and sole pressure. These precautions are necessary in order to lessen the possibility of the animal getting inflammation of the feet (*laminitis*) from long standing.

For ten days or so before sailing, the horse should be put on laxative food, if he be at all gross, so as to protect his system as much as possible from the attacks of any kind of inflammation. With this object in view, I would advise a bran mash every night, and carrots and green fodder, with very little corn.

The amount of food to be laid in for a voyage can be calculated on the following allowance:

Amount of Forage, etc., per Day.

Hay	18 lbs.
Oats	3 ,,
Bran	5 ,,
Linseed	3 oz.
Salt	2 ,,
Water	6 gallons.
Straw (for bedding)	5 lbs.
Carrots	a few daily.

The linseed may be given as a mash, from time to time.

Besides this, a bag and a half of sand per week may be allowed for the animal to stand on.

The following articles of clothing, etc., will be necessary:

A suit of warm clothing complete.
A couple of horse rugs.
A waterproof sheet.
A large fly-net to fit over the head and neck.
A pair of knee-caps.
Head collar and side-reins.
Watering bridle.
Brush and curry-comb.
Hoof-picker.
Half-a-dozen cotton rubbers.
Two sponges, one for the eyes, another for the dock or tail.
A large pot for boiling linseed, etc.

Slings.

A set of felt hoof-covers for applying warm or cold water.

The rugs may, with advantage, be covered with canvas.

For a voyage of a month or two, it is advisable to lay in a few medicines, etc., as follows:

Six physic balls (containing 4½ drachms of aloes)	
Nitrate of potash (nitre)	4 oz.
Sweet spirits of nitre	1 pint
Tincture of opium	12 oz.
Oil of turpentine	2 pints
Camphor	2 oz.
Alum	1 lb.
Linseed oil	½ gallon
Tincture of myrrh and aloes (for abrasions)	8 oz.
Lunar caustic	1 ,,
Bicarbonate of soda	1 lb.
A rasp.	
A searcher.	
A pair of leather shoes for fomenting the feet.	

The horse should be provided with a box in which to remain while he is on board. The best form of box for a valuable animal is one 7½ ft. long by 5½ ft. wide. It may be provided with sliding bars, by which the width of the box may be reduced one half, so that, if need be, support by them may be given during rough weather. Such a box can carry two horses, who will be far more comfortable in it than if they were in separate ones of 3 ft. wide. The ordinary form of box is about 6½ ft. long inside, and about 2 ft. 9 in. broad. In a large box, like the one described, the horse can lie down with perfect ease, even during comparatively rough weather, and can take some exercise; but in a short, narrow box, he will be obliged to keep on his feet the whole time.

The box should be provided with doors at both ends, so that the animal or animals may be able to go in or out of it, whichever way it is turned. It should have massive iron rings, placed in convenient positions so as to enable it to be hoisted over the side by means of the crane, and there should be placed semi-circular iron bars over the top, to give it stability, and to afford support for coverings. In bad weather, watertight white canvas covers, properly secured, act well. In very hot weather an awning may be required. Strong iron rings should be let into the deck to enable the box to be securely lashed down.

The inside of the box should be thoroughly well padded throughout its entire extent. Straw padding, covered with canvas, as is generally used, proves ineffective; for it soon gets hard and works downward, leaving the upper portion of the woodwork unprotected. I would strongly advise the use of large pieces of felt, to be secured by being laced through holes bored in the planking, so as to dispense with the employment of nails of any sort next the horse.

The floor of the box should be laid down with thick, rough coconut matting, having a long, thick "pile" or "nap," into the upstanding fibres of which the feet of the animal may sink, and thus obtain secure foothold. Six ordinary door-mats made of this material, if sufficiently long, will do for a box, five to cover the floor, and one extra, so that the rearmost mat may be taken out and dried, and the others pushed down in succession. If only smooth matting be procurable, it should be kept covered with about three inches of sand. If possible, battens should not be fixed on the floor of the box, for horses are apt to injure their feet by persistently standing with their heels on these slips of wood. I cannot explain why they adopt this procedure, instead of using the battens as a fixed point for their toes in the manner intended by man. With their heels on the battens and their toe on the floor they adopt a position which is eminently calculated to induce *laminitis*.

Straw should not be put under the horse in rough weather, as it is very slippery. A little of it, however, may be shaken a couple of times a day under the animal for him to stale on, so that his legs may not become wet. Straw may also be used for preventing the horse from knocking himself about, or from being injured in bad weather. With this object it is well to have four or five bags filled with straw, to be used as occasion may demand.

The box should be placed on deck as much *amidships* as possible, and *athwart ships*, but not *fore and aft*. On long tacks the horse should face to windward, the box being turned round if necessary. In placing the box, advantage should be taken of any cover that may afford protection from seas breaking over the vessel.

Steamers with flush decks and little *shear* are by far the worst on which to convey horses on deck. Those provided with high bulwarks are the best

A ship that is light, and is consequently high out of the water, will naturally be safer for horses on deck than if she were deep.

The box should be opened morning and evening to enable the attendant to clean it out. On other occasions it should be kept closed.

During the fine weather slings should be placed under the animal, so loose as not to press against his belly when he stands up, but tight enough to enable him to rest his weight on them if he chooses. If it gets at all rough, the slings should be at once removed.

If the horse be quiet, he may be taken out from time to time, when the sea is very smooth. On no account should he be allowed to walk on the deck if it be at all wet or greasy. There is no need to groom the horse beyond sponging out his eyes, nostrils, dock, etc., and picking out his feet, except when the weather is so fine that he can be taken out on deck, for accidents with horses on board ship are very liable to occur. The horse's head should be secured by means of side ropes attached to the head collar.

During hot weather the horse should be kept principally on bran and hay, with very little corn. A stock of carrots should, if possible, be laid in.

After a horse has been on board three weeks, his heels and the walls of his hoofs should again be lowered.

An owner should make arrangements with the captain of the ship for help to be given by some of the crew, in the event of its being required during bad weather. Liberally "paying one's footing" on the forecastle will have a good effect.

"After landing healthy horses which have been at sea for three weeks or longer, it is advisable to keep them for a week or ten days in loose boxes, so that they may recover the use of their feet, before they are, very gradually, brought on to work. A walk, even of a couple of miles, immediately after coming off ship, is apt to set up laminitis; although, previously, no symptoms of that disease had been apparent."*

See *Veterinary Notes for Horse-Owners*, by the same author.

CHAPTER IX

STABLE SERVANTS

Syces—Grass-cutters—Shoeing-smiths—Riding-lads.

SYCES.—Although remarks on the management of native stable servants hardly come within the scope of this work, still the subject so nearly concerns the welfare of the noble animal about which I am writing, that I cannot refrain from offering the following hints for the use of inexperienced horse owners.

I may state that the great art of getting on well with one's servants, and, consequently, keeping them up to their work, is to treat them in a uniformly just and sympathetic manner, while always maintaining towards them one's proper position as master. One should never swear at, beat, or fine them. The first-mentioned practice is degrading to oneself; the second is cowardly and illegal; and the third is as silly as the proverbial one of cutting off one's nose to spite one's face, for the syce will in the large majority of cases, if fined, scamp his work, or "take it out" of his horse, so as to make up for the loss he has sustained. From a long experience among stable servants, both in India and England, I can say with confidence that, as a rule, those of the former are as trustworthy, hard working, and intelligent as those of the latter country. The masters who have most trouble with their native servants, and whose horses get worst looked after, are generally young "griffs" who know little or nothing of the language of the country, and are always abusing their syces for being fools—as if, forsooth, "the boot was not on the other leg"! Horse owners may observe the following rules with advantage:

Endeavour to give orders concerning the horses as clearly as possible, so that there may be no chance of their being misunderstood.

Pay the servants liberally and regularly.

Insist on the practice of the syce, in the case of anything going wrong with his horse, instantly reporting the matter.

On no account allow a syce, on his own responsibility, to treat any ailment his horse may get, such as cracked heels, cuts, etc.; to have any voice in the shoeing of the animal, or to make any arrangement about getting corn from the grain merchant (*bunnyah*).

If any of the servants are not amenable to kind treatment, they should be dismissed at once, for a master who is known to be good to his men will never be in want of a choice of applicants for employment. One should not, if possible, keep a discontented servant.

Make certain that the syce can live on his pay, for if he cannot do so he will assuredly steal his horse's grain.

Before the cold weather comes on, supply each syce and grass-cutter with warm clothing and a blanket, so that they may not be induced to take off the horse's rugs at night to use as bedding for themselves.

In Indian racing stables syces are generally given a month's pay for each race their horses win.

It is the custom to allow each syce a bottle of oil and a pound of country soap for their respective horses every month.

If an owner suspects that his syce steals the horse's grain, he may have it sprinkled by a sweeper with water before it is given, for then the syce will regard it as polluted, and will not eat it.

The old adage about the master's eye making the horse fat applies particularly well to India.

A native shoeing-smith usually gives a syce four annas for each time his horse is shod.

It is usual in large stables to make the steadiest syce headman over the others, and to have him responsible in case anything goes wrong. He is called a "jemadar syce," and gets an increase of one or two rupees a month.

GRASS-CUTTERS.—When a grass-cutter goes out to cut grass, he should bring back a double supply, say 28 lbs., so that half the number of these servants may remain present to help the syces.

Grass-cutters are sometimes expected to provide bedding for the horses. I would advise that instead of this being done the owner should allow a rupee a month per horse for straw, requiring in return that the grass-cutter should assist in grooming.

When marching horses by road, each grass-cutter should accompany his horse, and should carry a feed or two of corn, four or five pounds of grass, a brush and curry-comb, a hoof-picker, a rubber, picketing ropes, and any odds and ends required, so that the horses may not be inconvenienced by the carts which carry the corn, gear, etc., being delayed on the road. One bucket between two or three horses will be sufficient.

SHOEING-SMITHS.—Native shoeing-smiths generally charge from Rs.1 4a. to Rs.1 8a. for shoeing, and 12a. for removing.

With a large stable it is a good plan to employ a shoeing-smith on a fixed salary. As a rule they are neat workmen, and will readily learn if properly taught. Their pay varies from Rs.10 to Rs.16, for which they will shoe and plate their master's horses, and, if attached to a racing stable, will accompany them from one meeting to another. They expect permission to shoe during spare hours on their own account.

RIDING-LADS.—Having got horses to train, the next thing is to find some one to ride them in their gallops, for owners are hardly ever light enough to do this. Besides, a man can generally train better by superintending work than by riding gallops himself. If possible, no one over 8 st. 7 lbs. at the very outside, should be put up, for any more weight will certainly tend to shorten the stride of a horse, especially that of small ones like Arabs. On the other hand, too light a lad—say one of 7 st.—may not be strong enough to hold a big horse together, and it is always better to put up a little extra weight in the shape of muscle than to allow a horse, particularly a young one, to sprawl all over the place. When a horse has once learned to gallop, unless he be a determined puller, an 8 st. lad will generally be able to do all that is wanted, and with such a one up—if he be at all a " workman " —a horse's legs will stand far longer than under a heavier weight, and the owner need not fear fast work to the same degree as he should do the other. One may sometimes chance on an English jockey who is light, does not drink, and is a good race-rider. Such a man is indeed a treasure, and will be cheap at Rs. 150 a month, Rs. 100 for winning, and Rs. 50 for losing a mount, if the owner keeps four or five horses. But anything short of the genuine article should be shunned, for one of the nondescript lot would take more looking after than a stable of twenty horses. In default of a regular English jockey, an owner's only safety is in employing quiet native lads. Probably he will have to make a selection from his syces and grass-cutters, or from their sons, and be obliged to teach them himself to ride. As the British nondescript is to be avoided, so is the genuine "coachwan," who delights in gold-laced caps and in sticking out his toes in front of his horse's nose. The best native riding-lads I have met have been syce's sons, whom their masters taught and succeeded in keeping in order. From Rs. 6 to Rs. 10—the " coachwan " will require Rs. 30— a month will be enough for such boys, with a small present, say Rs. 5 when any of the horses win. The master should be most careful in keeping them in their place, and should always insist on their helping the syces when grooming. Treat them fairly and a little liberally at times, but never "give them their heads" nor allow them to gallop a horse or take one out of the stable without being present oneself. The three great faults of native boys are, that they ride with too long stirrups, stick their toes out too much in front, and do not "ride a horse up to his bridle"—a fatal failing in race-riding. Besides, when silk is donned, almost all of them lose their heads when it comes to a finish with English jockeys.

After a native boy has been taught to ride with a fair seat and good hands, the next thing is to give him some idea of pace, which is usually taught by employing the "anna system." As there are 16 a. in a rupee, a 4-a. gallop is made to stand for quarter; 8-a. for half; 12-a. for three-quarter; and 16-a. for full speed.

Each quarter of a mile being clearly marked by a post or pillar on the course where horses are galloped, the trainer, when instructing native boys, should tell them before each gallop is given how many annas' speed he wants, and then may accurately time each quarter of a mile with his stop-watch, so that after the gallop he may be able to correct the boy, and point out where the latter went too fast or too slow, as the case may be. The eye alone is not sufficient to detect slight variations of pace. Besides, if the master holds the watch, the boy will more readily believe that he is being told correctly. If the lad be willing and intelligent under this system, and be given instructions as to holding his hands, keeping the proper position of his leg and foot, judging the right length of stirrup, etc., he ought to learn to ride a training gallop fairly, in, say, three months. The trainer may teach the lad the rates of speed by a conventional standard (see *p.* 210), or by the exact division of time, as take, for instance, that the length of the racecourse is 1¼ miles, that the horse in question can do this, with the boy up, at full speed in 2 min. 45 sec., and that the order for the training gallop is "once round at 8-a.," then the time the horse should take would be 5 min. 30 sec. This is slower than the accepted idea of what half speed should be; but if a faster pace be required, it is just as easy, and perhaps tends less to confuse the lad, to increase the number of annas ordered. Here I take for granted that the racecourse is level, like almost all Indian ones. At Poona, Bangalore, and Dehra Doon, for instance, further directions would be requisite to teach the lad to slightly vary the pace, as the nature of the ground might require.

CHAPTER X

SHOEING

Shoeing—Plates—Tips—On shoes getting loose.

As I have discussed at some length, in my *Veterinary Notes for Horse Owners*, the principles and practice of shoeing, I need not here do more than recapitulate what I have already written on that subject, while adding a few observations that are specially applicable to India.

SHOEING.—In preparing the ordinary healthy foot it should be lowered so that the frog, wall, and a portion of the sole should bear weight, while maintaining the part at a proper slope—about 50 degrees for the fore, and 60 degrees for the hind hoofs, viewing them in profile. In doing this, the sole should be left untouched with the knife. Broken or diseased portions of the frog should be removed. The clenches of the old shoe ought to be cut off by the buffer, without the use of the rasp.

The shoe should be as thin as possible, consistent with its standing wear, and should be perfectly flat on the foot surface.

The nail-holes should be punched "coarse" (well away from the edge), so that the nails may take a firm hold when the outer edge of the shoe is made to coincide, as it ought to do, with that of the ground surface of the foot. It is well to fit on the shoes hot, although this cannot always be done in India.

The shoeing-smith should refrain, as much as possible, from rasping the external surface of the hoof. He should not "spring" the heels of the shoe, *i.e.*, he should not leave a space between them and the horny heels, and he should on no account be allowed to hammer down the heels of the shoe on to the heels of the hoof after the nails have been driven, for this practice is a fruitful cause of corns, as it gives rise to undue pressure on the "seat of corn."

Native shoeing-smiths, to save themselves trouble, will almost always if ordered to supply thick-heeled shoes bring ordinary ones, the heels of which they have thickened by simply reducing the width of the web by hammering, instead of getting shoes made expressly for the purpose required. As they manufacture neither shoes nor nails, but obtain them ready-made from the *mistree* (blacksmith), there is usually some difficulty in inducing them to adopt any new ideas concerning the shape of shoes.

Plates are simply very light shoes, which are intended to last for only one or two races. They are generally fixed on the morning of the day before the race, and, to see that all is right, the horse is then sent for a short gallop, which constitutes that day's work. A light plate for an Arab will weigh about 2¾ oz., and be about ½ in. broad. But, as most horses in

India have to run at different meetings that follow each other in quick succession, I advocate using a stouter plate—in fact, a compromise between the plate and shoe used in training. Such a one for an Arab will weigh about 3½ oz., and ought to last through three weeks' work, and may be made ⅝ in. broad all round. Plates and light shoes may have a clip in front for the fore-feet, to give them additional hold. Nails for plates should be much lighter than those for ordinary shoes. An English plate, such as those used at Newmarket, weighs about 3 oz., is about ½ in. broad, ¼ in. thick, and is fullered. They are made out of specially prepared bars of iron. The hind as well as the fore plates have usually clips in front.

Mr. Darvell recommends, "If a horse's feet are weak and low, and he has to run on hard ground, it would be advisable to let him run in his shoes."

Tips.—We may briefly sum up the chief evils resulting from the use of shoes as follows: they tend to deprive the sole and frog of pressure, which, as a rule, is conducive to the health of the foot; the nails are liable to break away the wall; and the weight of the shoes tends to spoil the action of racehorses by making them go "higher" than they ought to do in the gallop. For these reasons, and on account of the fact that the hoof wears away principally at the toe, "tips," say about 3 in. in length, may often be employed with advantage instead of ordinary shoes, and especially for animals that are not required to work on metalled roads. A celebrated trainer for many years used only very short tips—just sufficient to protect the toes—for his horses, both in training and racing. He was forced, however, to discontinue this very sensible practice, on account of the continued opposition offered by the shoeing-smiths he had to employ to this supposed innovation. If tips are to be put on, they should be applied so as not to interfere with the proper slope of the foot.

On Shoes getting Loose.—We may ascertain if a shoe is loose, however slightly, by, after taking up the foot, gently tapping the ground surface of the shoe with the fingers. The nature of the sound thus made will serve to confirm or dissipate our suspicions. As long as the nails have a firm hold, so long will the heels of the hoof be protected from undue wear; but when the shoes become loose they soon get knocked to pieces, and the proper slope of the hoof will be destroyed for the time being.

CHAPTER XI

PREPARING PONIES FOR MEASUREMENT

As in India certificates of height are granted to ponies that need not be either in racing or even robust condition, preparation for measurement has become in that country an established practice. Knowing that such an ordeal will reduce the height of a pony for the time being from 1 to 2 in., which is equivalent to 12 to 24 lbs., I need hardly point out that an owner may have to adopt this means of getting the weight off if he wishes to run his ponies on equal terms with those of other men. It would be idle to deny that this practice inflicts cruelty on ponies, and is a potent incentive to deceit on the part of their owners. The present rule must be a great boon to owners, who in former times had to get their ponies measured before every race for which they ran. At the same time, its evil consequences might wholly, or to a great extent, be obviated, if it were enacted that a pony not holding a certificate of height should be measured on the day of and before each race for which he was going to start, but that his owner could claim a certificate for him in any such event at the height for which he was measured for it, if the measuring authorities were satisfied by the pony's running that he was in racing condition. It is, of course, evident that to be in such condition the animal could neither be "faked" nor drugged.

As I am in no way responsible for the moral or immoral tendencies of rules of racing in India, I shall leave the subject alone, but will describe the hateful methods generally adopted under existing requirements to get ponies to measure as low as possible.

I may first of all explain that, in the position which a pony has to adopt when he is being measured, the line of his fore-arms and front cannon bones has to be as nearly vertical as practicable; his fore-feet must not be unduly separated; his head must not be lowered beyond what will bring the upper line of his neck horizontal; no pulling down of the skin at the withers is allowed, and the hocks must be pretty well under him. As a rule, every chance is given to the animal to "settle down," so that he may measure as low as he can fairly do before the record is decided upon. No allowance is made for shoes. The height taken is (or, at least, ought to be) the vertical distance of the highest point of the withers from the ground.

Apart from the actual length of the bones, the height of a horse is affected chiefly by:

1. The condition of the muscles which connect the fore-limbs to the trunk; for the more they become relaxed by debility—whether from fatigue, ill-health, or the action of drugs—the more will the body, and consequently the withers, sink between the fore-legs.

2. The angles made by the bones respectively at the shoulder, elbow, and fetlock joints. This is especially noticeable by the descent of the fetlock joints.

3. Approximation of the ends of the bones which form the shoulder, elbow, fetlock, and the two pastern joints. We may see this settling down of the bones in the joints illustrated in our own cases; for if we have ourselves measured in the morning, and also in the evening, we shall find that we were taller in the former time than in the latter.

In accordance with these principles, we find that long-continued standing, fatigue, starvation, deprivation of water, and the administration of purgatives and sedatives will tend to cause a marked diminution of a pony's height. The production of a maximum effect will require a course of two or three months, during which time the animal, when he is in the stall, will be tied up, so that he may not lie down. Some operators advise that while the pony is tied up the ground upon which his fore-feet rest should be somewhat lower than that upon which the hind feet are placed. He is also walked a long distance every day. The food he gets is only just sufficient to keep him on his legs. Some give the unfortunate animal a quarter of a pound of Epsom salts every day, in order to keep him in a nauseated and debilitated condition, and walk the pony all night before bringing him up for measurement, giving him about an ounce of chloral hydrate not less than half an hour before he is to be placed under the standard. Prior to doing this he is kept standing for at least half an hour, so that he may "settle down." The final touches are given with a considerable amount of discrimination, lest the measuring authorities might reject the animal on the score of its being too sick. The practitioner will, from previous experience, accurately determine the extreme point to which he can go in playing his game with the members of the measuring committee.

As animals at sea get but little sleep, and usually have to stand all the time they are on board, it is often advisable, especially if they have suffered much in condition from the passage, to bring up for measurement ponies that have just been landed from a long voyage.

Some ponies measure lower when the head is held up than when the poll is kept on a level with the withers. The owner or his representative is usually allowed to hold the pony's head, and he will generally be allowed to use his own discretion in keeping it up or down, so long as the poll is not brought below the level of the withers. The measuring authorities, as a rule, will take under their own direction the placing of the animal's legs. It is almost needless to say that if the limbs are stretched out of the perpendicular, or if the fore-feet are unduly separated from each other in a lateral direction, the pony will measure lower than he would do were his position more in accordance with the rules for measuring.

Lowering the heels, within certain limits, will, by increasing the obliquity of the pasterns, decrease the height more than reducing the toes to the same extent.

If, however, the heels are so much pared down that the animal cannot stand firmly on them, the rasping or cutting will, as a rule, produce the undesirable effect of making the pony add to his height by causing him to bring his pasterns more upright than usual, with the object of relieving his heels of some of the painful pressure. It is thought by some that, in order to get a pony to measure low, it is better, after having reduced the heels as far as is safely practicable, to leave the toes long, with a view of bringing down the fetlock joints, than to pare them. In fact, I have seen shoes with very thin heels and thick toes used with this object.

CHAPTER XII

TEACHING HORSES TO JUMP

THE great secret of " making " good jumpers is to begin early enough with them ; for, once a horse has been thoroughly " broken", the sooner he is taught the special work required in leaping, the more accomplished fencer will he become. "Too Good," the winner of the Grand Steeplechase de Paris, as a four-year-old, and who was one of the cleverest performers " between the flags", received his name from H.I.M. the Empress of Austria on account of the perfect manner in which he negotiated, as a two-year-old, the difficult country over which his trainer, Mr. Linde, schooled his cross-country animals. He was only one of many instances of horses in Ireland, which is the home of steeplechasing, having thoroughly mastered the art of jumping before they were three years old. The action of the muscles of the hind-quarters and shoulders in leaping is so different from what it is in galloping, that early instruction, so as to impart the necessary knack, is of the greatest advantage. The fact of getting over the obstacles safely without losing ground is not sufficient for success ; for we often find that the winner of a steeplechase fairly beats on his merits others which could " lose " him on the flat, even when they do not make a "mistake." That famous chaser, the "Lamb", was a case in point, for in the Grand National he easily defeated "Pearl Diver", who was at least 2 stone better than the "Lamb" on an ordinary racecourse. By learning young, the jumping muscles are stimulated during the special period of development, and the action itself becomes almost automatic, and, consequently, as nearly perfect as possible; but if the art is not acquired until later on, the effort will be more or less laboured, and the muscles may be inadequate in strength for this new kind of labour. Of course, there are exceptions to this rule, one of the most notable being "Voluptuary" who, as a six-year-old, won the Grand National of 1884. This son of "Cremorne" and "Miss Evelyn" was kept till he was five years old, on the flat, where he performed very indifferently. He was then taken in hand by an accomplished horseman, Mr. E. P. Wilson, who soon taught him to negotiate the Aintree style of country, and won on his pupil with great ease. The Liverpool fences are all of a "flying" sort, and consist chiefly of hedges with a ditch on the taking-off or landing side. Being of a uniform character, they do not demand the same amount of cleverness that is required in the more cramped country. Besides, almost all the "Cremornes" are natural jumpers. It is a common idea among racing men, both in England and in India, that the way to obtain a good maiden chaser is to pick up a horse that has shown his ability to gallop, stay, and carry weight on the flat, and to teach him to jump. Following the opinion of the best judges on the subject in Ireland, I maintain that, as a rule, such animals will turn out failures, and that far better results, for the same amount of money, will ensue from buying "likely" young ones and teaching them their cross-country business when two-year-olds, if in Great Britain, or as three-year-olds if in India.

As I have discussed in another work (*Riding and Hunting*) the subject of riding, I need not dwell on it further than to repeat that the art of riding well over a country chiefly consists in making as little as possible of the jumps, and that the fact of the rider treating fences and level ground with equal indifference, will inspire his horse with confidence to take things in the same spirit. Horses, like boys, delight in a scamper in the country; and both detest their ramble being converted into a sort of "punishment drill", consisting of marching backwards and forwards over the same ground. Horses, also, being gregarious, love to follow their leader. Hence, we should take a fresh line of country as often as practicable; avoid making the horses jump the same fence twice consecutively; treat the obstacles as if they were things that were only accidentally met with during the stroll; endeavour to make the animals enjoy their outing as much as possible; and stimulate the young ones to go forward by the lead of one of their companions. In order to furnish a good idea of the kind of training for jumping which young ones get in Ireland, I give the following extract from a letter I received on this subject from Mr. Betagh, who had great experience with hunters and racehorses in Ireland:

"My system of teaching horses to jump is to avoid the whip and all harsh treatment in the preliminary lessons. I generally ride an old hunter out with the young one, and take a few easy fences, while the groom follows, leading the pupil with a long rein and cavesson. As a rule, the young one readily follows the other, especially if they have been companions at exercise. For the first few trials, a man with a whip may go behind the youngster and crack it after him; but he should seldom do more than give him a slight touch on the quarters if he does not go over freely. If a young horse is punished severely in his early lessons, he will for ever remember it, and will probably learn to refuse, from associating in his mind the cruelty he suffered with the sight of a fence. I seldom make the animal jump the same fence more than once; then move on to another, and so on. By varying the exercise, the young one will be induced to take pleasure in his work, which he will generally do if treated kindly though firmly. After a very few lessons, the colt may be ridden over his fences; but he should always, until he is fairly proficient, have a steady true jumper to give him a lead. When a young horse is handy at his fences, the sooner he is schooled with hounds the better; for there is nothing that makes a horse jump with such freedom and good will as following them. A short time ago, after teaching a colt of mine—a half-brother to Cosmos—to jump, I put a stable lad on him and took him to the Wards. At the very first fence, the crowd, at the only practicable spot, shut him out; and as the hounds were soon out of sight, he lagged behind, and I saw no more of him until I went home. The boy then told me that he had turned back, as he was not able to get over the big fences. A few days after that, I had the same colt and boy out with my own harriers, and gave the lad strict orders to stick to the hounds. The result was that the colt never turned his head from anything. I had hardly landed over one enormous bank with a grip on the taking-off side, which was almost too big for my liking, although I was on one of the boldest hunters in Ireland, when, to my surprise, the young one was at my girths, sailing away in high delight at the fun.

"It will not take long to make a young horse a good jumper provided he is treated with kindness, firmness, and common sense. As soon as he gets confidence in himself, he will be fit to go over any steeplechase course; and then the pace may be increased at the fences. He should, if possible, always be ridden in company; sometimes getting a lead, at other times taking it, or going all abreast."

Leading-rein Crupper.—The preliminary practice I would pursue in "making" a jumper, is first to give him a good mouth by driving him on foot in in the manner I have described in *Illustrated Horse Breaking*, and then teach him to leap without any one on his back. The great advantages of this method are that the horse which is broken according to it, acquires a perfect mouth, is under absolute control, and is free from the ill effects which too frequently result from the punishment and "jobbing" in the mouth that are inflicted on "green" horses by bad-tempered and incompetent riders. After a horse has learnt to leap well, when driven over jumps with a rider who does not hold the reins on his back (see *Illustrated Horse Breaking*), he will be far less liable to become spoiled by a rider of but moderate skill, than he would be had he not received his first lessons with the "long reins" and "leading-rein crupper."

A very safe way for teaching horses to jump is to make a circular course of not less than five yards broad and about 150 yards in circumference, and enclose it with high palings, while four or five fences of different kinds—say, a hurdle topped with brushwood, an Irish bank, a stone wall, a water jump, and a post and rails—may be placed at intervals round it. The horse is then turned loose in this kind of circus, either with or without a leader, and is made to jump with a little persuasion. This plan should be used only as an introduction to schooling.

After a horse has become perfect in his preliminary work, he should be gradually brought on to the negotiation, if possible, of a "natural" line of country, or, failing it, by one of "made" fences. At first the best kind of obstacle for a young or unschooled horse is low hedges or fences made up of thorns, as they will make the animal see the necessity of clearing them, without, at the same time, frightening him by bringing him down. The height, of course, should be gradually increased. Special attention should be paid to getting him clever at water and fences that have a ditch in front of them, as they are, of all others, the ones which horses, as a rule, are most liable to refuse. "Artificial water," which is used on many training courses in England, and consists of a white sheet or whitewashed strip of ground of the required length and breadth, with a bushed fence of a couple of feet high in front, may be employed with great advantage in India, where suitable brooks are generally difficult to find. It has the great merit of causing to the rider who goes at it the smallest possible amount of trepidation, as he will know that it cannot bring him to grief. Artificial water, arranged as described, is usually taken by horses in all good faith as the real article.

In India, a capital plan for teaching horses to become clever over walls without running any undue risk, is to practise them over walls made up to the proper height with single rows of sun-dried bricks, which will come down if the animal "chances" them, but will hurt his shins sufficiently to render him more careful in the future. For making a horse clever over posts and rails, one should employ a very thick log or trunk of a tree, so that the animal will understand that it is no use attempting to knock it down. In my opinion, the bar ought not to be made to fall down if the horse strikes it. If the breaker or his helper be not prepared to mount and take the necessary risk, they may put the animal over by means of the driving reins and leading-rein crupper, in the manner before described. The bar may be bushed over with thorns. A bar, which should be gradually raised, may be placed across the stable-yard gateway, or other convenient passage, so that the horses may get accustomed to jump it when going to and returning from exercise. Similar expedients with other kinds of fences may be adopted, as the trainer sees fit. I need only add that "made" fences should be as long from side to side as possible, and have wings if necessary.

Horses that are being trained for steeplechasing should be taught to take their fences fast and in company. One great secret of success in this form of sport is to accustom the horses to the exact style of country over which they have to travel.

PART II

TRAINING AND RACING

CHAPTER I

RACING IN INDIA

Racing men and horses—On forming a useful stable—The style of race horse suited to India—The different classes and their respective form—Timing.

In England, racing is almost entirely confined to professionals, and to a few moneyed men who can afford to run horses for amusement just as others go in for yachting, hunting, or shooting, caring little for the cost as long as they get sufficient excitement out of the particular sport they pursue. It is such a complete business, and its attendant expenses are so heavy, that a man of moderate means cannot with any safety follow it, unless he adopts it as his profession. In India, the small amount of public money and limited speculation render the turf, as a rule, too precarious a means of living, except in the case of jockeys and trainers. Few of the latter find training pays, unless they be light enough to earn their winning and losing mounts on the horses of which they have charge.

There are not many representatives of the moneyed section of the racing public in India, which is, above all others, the country for a comparatively poor man to do a little racing in without it costing him much, provided he knows *something* about horses; for stable expenses are very moderate and none but first-class animals cost extravagant sums. But the fact which enables men of small means to race in India is the system that divides the majority of races among different classes of horses. These events serve both to fill up prospectuses and to accommodate owners. Except at the few centres of racing, it is difficult to collect sufficient money to attract first-class animals, even were there more of them in India, so that handicaps have to be resorted to in order to bring the one or two of them which ever appear at a small meeting, together with the second-raters. On this account, stewards of race meetings, in order to get fields together, are obliged to add to handicaps races for "all horses", and selling races; those for Arabs, country-breds, galloways, ponies, and for maidens of the different classes, not to mention still more minute divisions. Thus an owner would have bad luck indeed were he not able to find one event or another suitable to his horses, even if he had nothing better than a country-bred pony, a half-miler, and a jumping nag, although their united value might not exceed two thousand rupees. It may be objected that this is not *racing*, which it certainly is not in the English sense of the word; yet, for all that, a man who is sufficiently fond of horses to look after and manage them himself, can get good sport with a few moderate ones. Personally, I should take more interest in training an inferior animal, and, by skill and work, winning races with him in moderate company, than in owning (as many do in

England) first-class horses which were entirely in the hands of a trainer, on whom I should have to be solely dependent for information as to their form and pretensions.

Six or seven horses will be found a large enough string for up-country meetings, if the owner intends to look after them himself, and expects them to win enough to cover their expenses. To accomplish this one should have horses of a useful class that would be certain to find races to run for at the different meetings to which they might go, with a fair chance of pulling off an event now and then. Keeping horses too good for one's line of country is hardly more paying than owning animals too bad for it. The presence of first-class horses (if their form be known) deters owners from entering against them; the races do not fill; and even if they do so on an odd occasion, it is simply "buying money" to back them; while in handicaps, a good horse, among moderate ones, gets so much weight piled on that it is almost certain either to break him down or to spoil his action. An owner should remember that knowledge of the best manner in which to "place" his horses is the great secret of success in racing.

A first-class steeplechaser does not come under these objections; for "between the flags", one's money being "in the air", men will usually enter on the outside chance of a fall or refusal. Besides, the added money alone is generally worth running for, even without speculation.

One or two good second-class Australians which can stay up to a mile and a half, a couple of Arabs—especially if one or both be galloways, and are at the same time good enough to run among the big ones, as "Chieftain", "Caliph", "Abdool Rayman", and "Rex" were—a fast 13.2 Arab, or country-bred pony, a half-miler for selling races, and a good chaser, would form the *beau ideal* of a useful stable for up-country meetings.

A good maiden is a real Eldorado, whether Australian, Arab, or chaser; but they are particularly hard to get, and uncertain to back, unless one has first-rate trying tackle with which to test their powers. Maidens in India take, to some extent, the place which two and three-year-olds occupy in England, for many of the most important races are confined to horses that have never won during any previous season, irrespective of their age; though, of course, allowance of weight for it is always given.

Speaking generally, no weight within reason can bring Arabs together with even second-rate Colonials.

For many years we have not had a single Cape horse that could hold his own against Australians. As quite as high prices can be obtained for good horses in South Africa as in India, it evidently would not pay to export them from the former to the latter country.

There is a sort of fatality about English horses in India; for few out of the many that are imported prove, either as racers or as ordinary riding-horses, to be worth their passage money out to this country. The feet and legs of imported English horses are much more liable to "go to pieces" on the hard Indian ground than those of horses bred in Australia, New Zealand or the Cape. The chief reason for this, in my opinion, is that the drier climate of our southern colonies is more favourable to the development of soundness in wind and limb, as regards horses, than is the moister one of Great Britain. I am inclined to think that horses bred in a dry climate, and, consequently, on hard soil, will after a few generations have legs and feet of a much better shape to stand work on hard ground than those of animals that are natives of a damp country. In this respect the horses of Australia and the Cape can compare very favourably with those bred in England, a large proportion of which possess those upright pasterns that are unsuited to work on Indian soil.

The majority of Indian racecourses are so hard that they tend to make horses which are trained on them go short and "stilty." Even when the track happens to be soft, the "going" is simply heavy, without any elasticity, so that the horse is taught to "dwell on his stride." In India we hardly ever obtain the happy medium afforded by the light springy turf in England. Good legs and feet are the first considerations, and then comes the power of carrying weight and being able to stay. An English horse, or Australian, should be able to race under 10 st. 7 lbs., 1¼ miles. If a sound, game horse can do all this, his being a little "troubled with the slows" will not prevent him from paying his way. A flashy thoroughbred that could stagger home in extraordinary good time over 5 furlongs, with 6 st. up, would be out of place in India, except, perhaps, for a *coup* at Calcutta.

Country-breds sometimes hold their own in hack selling races—winner to be sold for from Rs. 200 to Rs. 500—when not beyond ¾ mile. Those that do so have almost always a strong dash of English blood, from which they generally derive their turn of speed, as well as some of their inherited infirmities, which doom them to running for such minor events. A useful horse for such races—winner to be sold for Rs. 500 or Rs.600—ought to be able to do with 10st. up, ½ mile in 52sec., or ¾ mile in 1min. 19sec., on an ordinary racecourse.

Without wishing in the slightest to attempt to discourage those who desire to improve the breed of horses in India, I must point to the fact that racing stock of even the most moderate pretensions cannot be bred in India without the blood being constantly renewed by suitable importations, whether from Europe, the Colonies, or America. The effect of the climate, which is manifest in the indigenous equine type, will not allow, without constant foreign aid, the production of animals fit either for the turf or for heavy saddle work. The country produce bred by General Parrott from nearly pure English blood, although incapable of holding their own against Australians, were, at weight for age and class, capable of defeating Arabs at all distances. As a rule, however, the sons of the desert have "the pull" in races of 1¼ mile and upwards against other country-breds.

We must regard English ponies as a good deal better than those of all other classes. Next to them come Australasian ponies, then Arabs, and, lastly, country-breds. As exceptions I may mention the Arabs, "Rex" and "Blitz", who, for their respective heights, were as good as anything that ever carried silk in India.

Though there have been many instances of 13.2 ponies running successfully among galloways (14 hands and under) at the usual allowance of 3 lbs. the quarter-inch, it is rare indeed to meet with a pony lower than that which can do so.

At most meetings the following classes are those for which races are generally made, with the distances usually run:

1. All horses	1 to 2 miles.
2. Arabs	1¼ to 2 ,,
3. Arabs and country-breds	1 to 2 ,,
4. Country-breds	½ to 1 mile.
5. Ponies (14 hands and under)	½ to 1 ,,
6. Ponies (13.2 hands and under)	½ to ¾ ,,
7. Ponies (13 hands and under)	¼ to ½ ,,
8. Selling-race horses	½ to 1 ,,

In discussing the "form" of horses, I have been obliged to bring in the subject of timing, as it is so universally used and regarded in India. I am aware how fallible a test it is, and how much it varies according to the state of the course and the way in which a race is run. The great majority of Indian courses are so level, and the "going" so very much the same on all, that there cannot be the same objection to timing in India as in England, where every course varies in severity, especially if rain falls. Nevertheless, in races in England, where several horses start, and in which the running is certain to be cut out by some of them, the timing of similar horses is singularly close on the same courses, considering how variable is the English climate. For instance, take that of the great three-year-old races from year to year.

We find timing is a perfectly reliable test in pedestrianism, and can pronounce with certainty that a man who can do his 100 yds. in 10sec., or his mile under 4min. 16sec. on level ground, is undoubtedly a first-class runner; and so would be a horse which could, with weight for age and class, do his mile in 1min. 43sec., or two miles in 3min. 39sec. on the Calcutta course, for instance, *if he will but try* in public, for herein lies the source of nine-tenths of the disappointments timing leads to. The "going" on most Indian racecourses, except at Bangalore, Hyderabad, Poonah, and Dehra Doon, is very similar, being almost quite level and pretty hard. As it is impossible to get all horses to run the same in public as in private, I would strongly advise the young turfite to limit the use of the stop-watch to public performances, and to regulating the pace of training gallops. If one wishes to test the powers of a young one, it should be done, not by "putting him against the watch," but by trying him with some horse that has recently run well in public, and is at the time of the trial in racing condition. Then, if the young one beats the trial horse, and does the distance in really good time, it is all the more to his credit. No exact information as to a horse's form can be obtained by timing his gallops when he takes them alone, for not one horse in ten will run the same by himself as in company, and it would only lead to disappointment to allow for an error that, for all the owner knows, may be either for or against his horse's powers.

I believe that even with the greatest care, and under the most favourable circumstances, the time test alone cannot be relied upon with a smaller margin for error than 10lbs. in 1 mile, which, allowing for difference in horses, and for the different way races are run, we may assume would be equivalent to from 20 to 30 yds. in that distance, or from 1¼ to 2sec., which does not say very much for timing, beyond affording an approximate idea of a horse's powers.

On a heavy course a horse will take 4 or 5sec. longer to do a mile than on a light one.

Another thing to be considered is that we must allow at least half a second for the timer's own individual error, while there is still more to be allowed for the way in which horses get off, whether from a flying start or from a walk.

It does not at all follow that because a horse cannot be got to do good time in private he is on that account a moderate animal, for many, particularly stayers, require the stimulus of company to make them extend themselves.

When timing in private, the trainer should be most careful to observe how his horses finish, for an animal who finishes strong will always, provided he runs honest, beat another that can do even slightly better time, but is " all out " on nearing the winning-post.

CHAPTER II

ON THE THEORY OF TRAINING

Training—Development of muscle—Effect of exercise on the system—Nature of exercise—Food—Health—Sweating—Artificial sweating—Physic—Signs of condition.

TRAINING is the art of preparing a horse to gallop a certain distance at the greatest possible speed.

In order to accomplish this, the following conditions are necessary:

(1) That the muscles used in galloping be developed to the highest extent for the object in view.

(2) That the whole system, both nervous, muscular, and functional, be in a healthy state.

(3) That the organs of breathing and circulation be in the best possible condition to sustain the system in its required effort.

(4) That the muscles be accustomed to the nature of the action they will be called upon to perform.

(5) That there be a minimum of fat in the system, compatible with health, so that the animal may not be retarded by useless weight, nor his muscles impeded by its presence.

DEVELOPMENT OF MUSCLE.—On this subject Dr. Carpenter (*Human Physiology*) remarks that "the frequently renewed exercise of muscles, by producing a determination of blood towards them, occasions an increase in the nutrition, so that a large amount of new tissue is developed, and the muscles augment in size and vigour. This is true, not only of the whole muscular system when equally exercised, but also of any particular set of muscles which is more used than another. Of the former, we have an example in those who practise a system of gymnastics adapted to call the various muscles alike into play; and of the latter, in the limbs of individuals who follow any calling that habitually requires the exertion of either pair to the partial exclusion of the other, as the arms of the smith, or the legs of the opera dancer. But this increased nutrition cannot take place unless an adequate supply of food be afforded; and if the amount of nutritive material be insufficient, the result will be a progressive diminution in the size and power of the muscles, which will manifest itself the more rapidly as the amount of exertion, and consequently the degree of *waste*, is greater. Nor can it be effected if the exercise be incessant, for it is during the intervals of repose that the reparation of the muscular tissue occurs; and the muscular system, like the nervous, may be worn out by incessant use. The more violent the action, the longer will be the period of subsequent repose required for the reparation of the tissue."

From this we see that, while giving the horse the exercise necessary to develop those muscles which are used in galloping, we should attend to his proper feeding; should afford him the rest indispensable for the repair of tissue, and should preserve around him the conditions that are most conducive to health.

EFFECT OF EXERCISE ON THE SYSTEM.—The various tissues of the body have but a limited time for existence, which period is directly influenced by the amount of exercise taken by the animal. Apart from the necessity there is for exercise to develop muscle, to reduce fat, and to maintain health, experience also teaches us that tissue which is formed under conditions of rapid waste and repair, is stronger and of better quality than that subjected to more gradual change; and anatomical investigation proves that the former, from being more vascular, is redder and healthier-looking than the latter. Hence, to improve the *quality* of the muscular and nervous tissues, we should give as much exercise as is compatible with the individual capabilities of the animal trained.

Exercise purifies the blood by quickening the action of the lungs, which supply oxygen to the vital fluid for the breaking up of effete matters contained in it. By quickening the circulation, it stimulates the processes of nutrition for the building up of new tissue, and of excretion, for the removal of effete and deleterious substances. It also strengthens the action of the heart and lungs.

NATURE OF EXERCISE.—We may conclude that this should gradually conform to that of the race for which the animal is being trained, so that, speaking generally, only the muscles which are particularly used in galloping may be specially developed; for, were other muscles also called into abnormal play, their extra nutrition would but tend to deprive the muscles used in galloping of material for repair, and would add unnecessary weight to be carried. No amount of trotting or walking can prove an efficient substitute for galloping, of which exercise the trainer should endeavour to give his horses as much as possible, under certain reservations to which I shall presently allude.

In order that fast work may be given with safety, the horse should be gradually accustomed to it; the golden rule here being that the length of a horse's gallop should never exceed the distance which he can go, at the time being, without his muscles becoming fatigued, or—which is the same thing—without his becoming "blown"; for neither man nor horse is ever so "beat" as when he is "out of wind." In fast work, the suspensory ligaments are particularly liable to sprain. In my *Veterinary Notes for Horse Owners*, I have alluded to this point as follows: "As long as the horse is untired, the muscles attached to the back tendons contract with such precision that the foot is 'picked up' (flexed) before undue strain can fall on the suspensory ligament; in fact, these tendons act as braces to it. If the movement be continued, the horse will 'dwell' more and more in his stride, until the flexor muscles, having become fatigued, may at length be unable to contract with sufficient quickness to save the suspensory ligament from undue tension. Although the muscles get tired, the ligament does not experience the sensation of fatigue; hence, towards the end of a tiring gallop, the horse will throw increased weight on the ligament, in order to save the muscles. It is easy to imagine how great the strain on the suspensory ligament must be in the case of a racehorse struggling home during a desperate finish. No wonder that when these animals break down, they generally do so in the last furlong, especially if the ligament has been previously injured. It is evident, too, why they are more apt to break down, when short of work, than when in good condition."

Fast work should be very sparingly given on hard ground, owing to the great danger there is of horses exercised on it spraining their suspensory ligaments, and injuring the bones of their legs and feet.

It is most important that the trainer should recognise the fact that he can greatly increase a horse's speed by practice. We find, as a rule, that a pedestrian who has been put into regular training for the first time, will, after a year's constant practice, do his 100 yards, say, 1 sec. faster, or his mile, say, 20 secs. better than he could have done before, even when in condition. The same holds good at boxing, fencing, and other kindred sports, and, undoubtedly, does so with horses, whose muscles obey the same laws as those of our own bodies. The benefit, however, which may be derived from practice in this respect will be more or less lost if the work be continued after the muscles have become fatigued, for the simple reason that, as soon as they get into this condition, the speed at which they first moved will become decreased, and what was, at starting, fast work, ends by becoming slow. Hence, the trainer, speaking generally, should rigidly limit the distance over which he sends an animal at a fast pace, to one which the horse can cover without having to slacken off at the finish.

"When a horse gets to know his speed in his exercise, it is seldom he can afterwards be got to struggle well in a severe-contested race." (Darvill.)

Experience teaches us that we must be very careful in applying to horses the fact that speed can be greatly increased by practice, because, if we push it to an undue extent, they will be apt to become disgusted with their work, and may refuse to "try", a proceeding which will nullify any calculation made on the basis of the horse being a machine. For this reason we should, as a rule, never fully extend an animal in a training gallop. If we have to do this in a trial or in a race, so much the worse for the horse in the great majority of cases, for, unless he is exceptionally "game", the fact of his knowing the utmost extent of his own powers will prevent him from struggling as resolutely as he would do were his self-knowledge less extended. We often find that after a severe finish, a good horse, even though winning the race, becomes converted for racing purposes into a worthless animal for the remainder of his life, and that the effect of losing the race under similar circumstances is still more liable to ruin a horse completely. Horses vary so much in the manner they stand fast work that it is impossible to lay down any detailed rules for guidance on the subject. Sluggish horses are, as a rule, far better in this respect than are impetuous ones; and thoroughbreds, than "cocktails." Pedestrians can stand more training than horses, and will often bear being extended day after day without losing their "turn of speed." This fact is probably to be accounted for by the higher development of their nervous system.

When a horse is restricted for some time to slow gallops, his style, however good it may have been originally, will gradually accommodate itself to this pace, and will in course of time become permanently altered, or take a long period to recover. The reason for this is that the muscles which are called into play, obeying a beneficent law of Nature, gradually acquire a style of action which will enable them to perform their accustomed task with the least possible exertion to themselves. Thus, when they have become habituated to a slow gallop, they will be unable to act at a fast pace to the best advantage because they are unused to it. This law is well proved by the fact that training horses for long distances has a very prejudicial effect on their speed for short races. Most men who have sparred much know how slow the use of heavy dumb-bells makes them.

Continued slow work spoils the action of the horse, in that it accustoms him to move his muscles slowly and to take short strides. Besides this, as it does not call into play his muscles of forced respiration (*p.* 179), which are greatly used at fast paces, it is entirely inadequate to render him "fit" to race. Work on deep ground causes a horse to shorten his stride and to "dwell on it." The practice of carrying heavy weights makes the animal go short. Training a horse on a hilly course, when he has to race on level ground, is a great mistake—always supposing that he is sound—for, from constantly going up hill, he soon learns to "go high," as he finds by doing so that he lengthens his stride. Although some really good horses like "Lecturer", the Cesarewitch winner of 1866, have high action, we must admit that they would be still better animals if they possessed more of a "daisy-cutting" style; for any undue bending of the knees must tend to shorten the stride. Of course the converse of all this, also, holds good. This was seen in 1871, when Colonel Macpherson's g. a. h. "Malabar" won the Dehra Doon Derby, from a field that contained two or three horses which could have given him, at least, a stone on the flat. His excellence up the hill was due to the fact that he had been trained on it for a couple of years. When he was subsequently taken to run on the level course at Umballa, he was found to be incapable of acting to advantage on it. During the lengthy preparation which "Scot Free", the winner of the Two Thousand Guineas in 1884, received for the St. Leger, he was given almost all his gallops on Side Hill or on Long Hill, both of which Newmarket training courses form comparatively steep gradients. I saw him do some of his last gallops before going to Doncaster, and although his muscular development was perfect, I could not help being impressed with the fact that his action was much " higher " than when he won the Guineas, beating "Harvester ", " Superba ", and others. He started first favourite for the St. Leger, and was never once " in it." I maintain that galloping a horse constantly up hill is not sufficient even for getting his wind in good order for a race on the flat. We know—to take an extreme case—that no amount of practice which a sailor might have in running up and down the rigging of his ship would enable him to " stay " even 150 yards on the cinder path, and that mountaineers, however good their wind might be for facing a steep hillside, are soon " blown " if they have to run fast on level ground; the reason being that both find the action a novel one to their muscles.

It may safely be concluded that a horse should very rarely be fully " extended " over a distance equal to that of the race for which he is being trained, and only then towards the latter end of his preparation. " Getting the distance into them " is too often synonymous with " taking the speed and life out of them."

Repeated fast work for comparatively short distances, with intervals of rest between, will be found to be accompanied by less risk of accident, and less danger of making a horse slow, than long fast gallops.

Fast work is not alone requisite for preserving and improving the speed of the limbs; but is equally essential for bringing the respiratory muscles into such a condition that they can maintain their action under high pressure. We may rest assured that if a horse be thoroughly fit and well, has had lots of work, and has had his speed developed and his wind made clear by plenty of short spins, with a few fast gallops for nearly the length of the race for which he is going to run, he will, in nineteen cases out of twenty, stay the distance, unless, indeed, it be beyond that of which he is naturally capable.

From the foregoing remarks we may infer that in order to bring a horse " fit to the post " we must give him a large amount of exercise, which should not be at a long, slow gallop. Hence, the exercise which we are unable to give at a fast pace, should be at one which will be as little prejudicial to his speed as possible, such as the walk, trot, and canter, which are totally different in their action from the gallop.

FOOD.—The old writers on training were accustomed to lay considerable stress on the necessity of " hard " food, and a restricted allowance of water, in order to reduce the size of a horse's stomach and intestines, and to harden his muscles. At first sight, the former consideration seems to be a most important one; because, if these organs be distended by the bulky nature of the food, the diaphragm will be impeded in its effort to afford room for the action of the lungs. As the question of food is entirely dependent on conditions of health and nutrition, the trainer may rest assured that if they be duly maintained the animal's organs will accommodate themselves, in the best possible manner, to the work which the horse is called upon to perform.

When a horse's powers are fully taxed, we may safely rely on his appetite being the best guide for determining the amount of his hay, corn, and water. The water supply should never be restricted. The horse will instinctively choose the proportion best calculated to furnish material for the repair of tissue, always supposing that he shows no signs of ill-health, and is sound on his legs.

HEALTH.—As the proper nutrition of the system is dependent on the state of the general health, we should endeavour to secure the former by maintaining the latter in the best possible condition, thus avoiding the too common error of neglecting the cause for the effect. Hence, if the slightest symptom of indisposition can be traced to the effects of the food, its nature or amount, as the case may be, should be changed at once. The usual symptoms of derangement, caused by errors in diet, are feverishness, with quickened pulse, and hot, dry skin; looseness or constipation of the bowels; the presence of flakes of mucus mixed with the dung, indicating irritation of the intestines; sour smell from the mouth; the practices of grinding the teeth and licking whitewashed walls, etc., which show acidity of the stomach; dark-coloured urine, evincing that the animal is fed on food of a too highly nitrogenous nature; yellowness of the gums and lining membrane of the eyelids, pointing to derangement of the liver; a disordered state of the skin; abnormal appetite, etc.

SWEATING.—The result of personal observations through a long experience in several branches of training on drawing either man or horse "fine", is that it is entirely a question of the state of the nerves of the individual trained; for, as "Stonehenge" remarks, "the nervous system cannot respond to the calls of its great centre without having a due supply of fatty matter." Horses, like men, vary in regard to the amount of fat which their systems can lose without their becoming "stale." Most men who have trained hard for pedestrianism, rowing, race running, etc., will practically understand the meaning of staleness, the causes of which we may infer are the same both in men and horses. When a man gets much below his ordinary healthy weight, whether by excessive exercise, physic, sweating, or Banting, and continues hard work, he will, as a rule, soon become nervous and shaky; a state which can be cured only by rest and by discontinuing the means taken to get thin; and then as his weight rises his nerves will regain their tone.

I do not for a moment mean to say that the disturbance of the equilibrium of the system, due to an abnormal loss of fat, is the sole cause of a horse becoming stale; for I know well that the effects of overwork and the feverishness induced by excitement and high feeding, also tend to bring about that condition. But I wish to make it clear that a certain amount of fat in the body of the horse is indispensable to the continued healthy action of his nervous system, on which is dependent the exhibition of all muscular force. Hence, we should avoid the mistake of drawing a horse fine too soon, and should endeavour to apportion his work in such a manner that he will be "trained to the hour", knowing well that it is impossible to keep him " wound up to concert pitch " beyond a few days.

When a horse under ordinary conditions is well fed and little worked, there is not alone a quantity of adipose tissue deposited in his system, but also a certain amount of *infiltration* of fat, in the form of distinct drops, takes place in the cells of the different tissues, and particuarly in those of the liver. The fat, by distending the cells, renders the muscles, liver, and other involved structures, unfit to bear the strain of violent and continued exertion. The object of training is not alone to get rid of the retarding weight of a quantity of superfluous fat, but also to eliminate the infiltrated fat from tissues that are called into action during work; hence, when we sweat a horse, we do so in order to remove from his system a certain amount of fat, some of which is broken up by the oxidation of its carbon by the agency of respiration, while the greater part of the remainder is carried out, in the form of oily matter, along with the perspiration, which fluid is directly abstracted from the blood. For the maintenance of health, the blood must contain a certain proportion of water, which varies, under special conditions, such as violent exercise, purging, deprivation of water, excessive perspiration, etc., from 700 to 800 parts in a thousand. If, in case of loss, the normal proportion of water be not speedily restored, the animal's health will suffer. Thus we may see that the proper object of sweating a horse is to reduce the amount of fat, and not the amount of water, there is in his system, and that as soon as we fail to find that oily matter is given off, to any appreciable extent, with his perspiration, so soon should we stop giving him any móre sweats. I need hardly point out how wrong and opposed to common sense and to physiological teaching, is the cruel practice of stinting a horse of water after sweating him. In fact, want of a due supply of water interferes with the whole process of nutrition. "The activity of absorption by the blood vessels depends upon the due fluidity of the materials to be absorbed, for it is well known that no fluids quickly penetrate the vessels, but such as are of lesser density than the blood." (Williams.)

From the foregoing remarks we may draw the practical conclusion that we may take, during training, the state of the perspiration as a guide by which to judge of the amount of fat in the horse's system, and that we should regulate his work so that the sweat, after his gallops, may not completely lose its greasy feel, until within a few days of the race for which he is being trained. This is, of course, supposing that he is one of the sort that will stand being "drawn fine."

ARTIFICIAL SWEATING.—By this term I mean any process of sweating which is accomplished without the aid of exercise, such as that by the Turkish bath, or by clothing the horse very heavily in a warm, closed-up stable, etc. Such sweating, I think, is most objectionable, unless indeed the state of the animal's limbs precludes exertion. When perspiration is thus artificially induced, the increased excretory action is confined to the pores of the skin, so that the blood rapidly becomes charged with effete matter which the lungs fail to eliminate with due promptness; as the respiration is not accelerated by exertion. Hence, the lungs become gorged with insufficiently aerated blood, which causes the breathing to become laboured, and the action of the heart tumultuous. These abnormal conditions cause general distress and tend to injure the healthy working of the heart, results that speedily —if oft repeated—upset the nervous system, and render the animal stale and incapable of prolonged and vigorous exertion.

Physic.—Before commencing training it is generally advisable to give a moderate dose of physic in order to eliminate from the system an excess of the products resulting from the waste of tissue, which are not excreted with sufficient rapidity for the requirements of hard exercise, and to get rid of the superabundant nutritive material absorbed from the chyle. The diseases known as *azoturia* and *lymphangitis* are respectively brought on when these two conditions exist to a highly injurious extent. In both, the administration of a purgative is advisable. Although we may not have either complaint developed, still, feverishness, "filled" legs, dark-coloured urine, etc., often result from similar causes, when the precaution of giving a horse a dose of physic is not observed before putting him into training.

Signs of Condition.—When a horse is in perfect condition, his coat will be soft and glossy like satin; his eye bright, but tranquil; his sweat scanty, will dry readily, and will be free from oily matter; his legs and feet cool; his muscles hard, prominent, and distinct from each other; those extending along each side of his spine will be full and massive; while those over his quarters will swell up to a certain convexity. The ribs will be defined, although covered with a powerful sheet of muscle, which, as well as the muscles that cover the belly, will have to become developed by the forced respiration necessitated by fast work. The fact of these muscles being in this condition is manifested by the presence of their raised though irregular border, which runs in a more or less diagonal direction down each side of the abdomen towards the groin. The "quarter mark"—division between the *biceps rotator tibialis* and *triceps abductor femoris* muscles—is well defined. The space round the anus should be prominent and filled up; the thighs so developed that they should meet for a considerable way down. The crest should be full and hard; and the large *caput* muscles which lie just above the fore-arm should form a distinct lump. "Who can fail to see in a well-trained racehorse the muscles, standing, as it were, prominently one from another about the quarter and thighs, 'hard as iron to the touch', and giving the animal an appearance of being thin and poor? The appearance of thinness is the result of the great prominence of each individual muscle, of increase in their volume and weight, and an extraordinary healthy tonicity." (Williams.)

CHAPTER III

FOOD DURING TRAINING

As the subject of food has been fully discussed in Part I. on Horse Management, I shall treat of it here only as far as it relates to training for racing. If oats can be procured heavy enough, they are generally the best grain on which to train, although maize and bran (*p.* 97), may be equally good. In England, old horses, whose powers of assimilation are somewhat impaired, are often allowed, with good results, a small proportion of beans, or half beans and half peas, with their corn, in order to increase the nutrient value of the food, as the measure of a horse's appetite is more by bulk than by weight. With light Indian oats, one part of gram to one of bran and three of corn will be found to be a good general division. The same proportion of *kúlthee* and oats may be used. Boiled *úrud* may be substituted for *kúlthee*. If oats be not procurable, parched barley and gram may be given.

Beans, peas, gram, *kúlthee*, and *úrud* are very similar in their composition, and barley closely resembles oats. These grains differ, however, in their action on the digestive organs, beans having a constipating tendency, while both gram and barley have the opposite effect.

The dung of a healthy horse should be fairly formed, brittle, friable, and devoid of any adherent slime. As health is, above all others, the one essential condition without which it is impossible to get a horse fit, the trainer should so regulate the food that the dung should present a normal appearance, which is comparatively easy to obtain in England where sound, heavy oats are procurable, but in India, where gram or barley often has to be used, the task is much more difficult, always considering the large amount of hard food that is requisite for the utmost development of a horse's powers. In cases where the digestion begins to become upset by too highly stimulating a diet, the trainer should diminish the quantity, and should further use means to restore the functions to a healthy condition. With this object in view he may mix chopped hay through the corn, or use from 3 to 6 lbs. of dry bran daily in place of it.

As a rule, as soon as a horse gets gradually into strong work, he ought to have as much corn as he can eat, provided the chief part of it be oats; 10 lbs. will be enough to commence on with an Australian, which quantity may gradually be increased by 1 lb. a week. A full average amount will be: gram 4 lbs., oats 14 lbs.; or gram 6 lbs., parched barley 10 lbs. In either case, 1 lb. of *suttoo* may be given in the animal's drinking water, as described on page 54.

An Arab will eat from 2 lbs. to 4 lbs. less corn than an Australian.

Oats, grain, and barley should always be given quite dry; the first should be bruised, and the other two broken. I found the following food suited an old Arab that I trained very successfully better than any other :

Oats	6 lbs.
Gram	4 ,,
Bran	2 ,,
Linseed	1 ,,

At night the two last-mentioned ingredients—the linseed having been previously kept boiling for two or three hours—were given mixed with 1 lb. of corn.

My experience is that even with Indian oats a horse can be got at least 7 lbs. " fitter " than with any other grain.

Horses in training should get a feed of bran once, and in some cases twice a week, as they may seem to require it. Saturday and Wednesday nights are generally the most convenient times at which to give it.

Through the cold weather a couple of pounds of carrots may be allowed with much benefit to each horse. In case they be not available, some green food may be substituted. The roots, or green fodder, may be stopped a week or ten days before running.

Linseed or hay tea may be given from time to time.

It is impossible to train a horse properly without good grass, on the quality of which quite as much, if not more, depends than on that of the corn. For this purpose, only the best picked *doob* grass (Madrasee, *burryalee*) should be used, after having been dried in the sun for a day. As a rule, the horse should be allowed as much of it as he will eat; unless, indeed, he is a very gross feeder, the time of his preparation is limited, or he is fat, while his legs are infirm. An animal on a full allowance of corn will eat far less hay than is commonly supposed. General Fitzwygram states that "practically it will be found that horses which are not limited in regard to oats will not usually consume above six pounds of hay per diem."

In concluding this subject, I may say that the trainer, while supplying the horse with food suitable for the requirements of his system when undergoing severe work, should never lose sight of the fact that the proper assimilation of such food can only be ensured as long as the functions of digestion are in a healthy state. To maintain this all-important condition, he should study the general question of diet and the various peculiarities of each individual horse; should preserve a sufficient variety in the food, so that the animal be not disgusted by a never-ending monotony, and should supplement the hard fare, from time to time, with a handful of carrots or parsnips, a bunch of lucern, of freshly-picked green grass, or of young oats or wheat, a piece of sugar-cane, a linseed mash—anything, in fact, to keep the appetite from palling on corn, which is, after all, the chief source from which to obtain muscle.

CHAPTER IV

DAILY ROUTINE IN TRAINING

DURING the training months, the syces should be up an hour before daylight, and should give each of the horses a little water, say, 2 or 3 pints, and from 1 to 1½ lbs. of corn, which quantity may be increased to 2 lbs. if the animals are to be kept out longer than three hours. When this is eaten, the clothing worn at night should be taken off, the coats wisped over and smoothened down with a towel; the manes and tails set straight; the eyes, muzzles, and docks sponged out; and fresh clothing put on according to the weather. The horses are now taken to the exercising ground, and are kept walking for fully an hour, so that they may empty themselves, and then they get their work, fast or slow, as the case may be. In some racing stables in England, the horses that go out early in the morning, say, at six o'clock, during the hot days of summer, get no food before starting, while in others they have a very small feed. The advocates of the former system aver that their animals, being empty, are in the best possible condition for getting work, and that nothing is gained by feeding them at that time. If we may reason from our own cases, we may assume that the horse in India finds his *chhotee baziree* both agreeable and "sustaining" before his morning work. On the other hand, it is certain that this practice of giving horses an early feed causes them, in many instances, to "scour" when taken out to work. We should, in such cases, omit this light repast. The diarrhœa which is set up in this manner is due to the food, the digestion of which was checked by exercise, acting as an irritant to the alimentary canal.

After a horse has finished his exercise, he may be either walked home to his stable or rubbed down on the spot. If the latter plan be adopted, he may be walked or trotted to the rubbing-down shed, or to the lee of any favourable cover. The girths should be slackened, and, if he be worked in clothing, his hood should be quickly removed, and if there be any sweat visible on his neck, it should be scraped off with the copper scrapers that are made for this purpose. Above all things, the hollow between the jaws should be carefully dried with a towel, for neglect of this precaution has often been the cause of subsequent cough or sore throat. The bridle should now be changed for a common watering bridle, as horses are apt to spoil the reins by biting them whilst being groomed. If the animal be restless a man may stand in front with a rein in each hand, and hold his head up, while one or two syces at each side rub him down with a wisp of dry straw or of *sun* (unprepared hemp). The wisps should be rubbed well into the coat, and should not be used as fans. If he be inclined to bite, the syce who holds the reins may keep a stick in one hand pointing across the horse's face, so as to keep him in order, or a muzzle may be put on. The breastpiece is next removed; the base of the neck and chest scraped and dried; and, lastly, the body clothing is taken off, and the barrel, loins, and quarters finished. Dry, light clothing is put on, and the horse should get half a bucket of water, say, about a gallon. This rubbing down should not take more than five or six minutes, and after it the animal should be started home at a walk without further delay.

Though the horse, on leaving his stable, should be ridden at a walk before his work commences, he had better be led home, for then he will return cooler, and will not be so liable to break out into a sweat again, as he would be were he ridden back. If the horse is to be ridden on his way home, the felt saddle-cloth, if it has been used, should be put on inside out, so that the portion of it which has become wet from sweat may not come in contact with the skin of the animal's back, for, if it did so, it would act more or less as a poultice and render the part soft and tender. Besides this, a dry surface next the skin is more comfortable than a damp one.

Arrived at the stable, the horse may get as much water as he chooses to drink, with or without *suttoo* mixed through it, as the trainer sees fit; and then he is tied up, his clothing removed, and the grooming begun.

The practice of rubbing a horse down immediately after his gallop is specially applicable to an animal which has been worked in clothing, and which, in consequence of the presence of the damp material next its skin, would, were it not removed, be liable to become enervated and chilled during the walk home. When, on the contrary, a horse is worked without clothing, which, as a rule, is much the best plan, it is advisable to walk him, or, if he be at all excitable, to have him led back to his stable. In this case also I would give him half a bucket of water to drink immediately after his work.

If a horse's coat is long, a considerable amount of hair can be got off by hand-rubbing him completely over immediately after his gallop, in place of wisping him down. For this, the help of four men is imperative, lest any one part of his body be allowed to cool faster than another. While hand-rubbing, the syces may keep their hands damp with water, so as to get more hair off.

The grooming being finished, the horse gets the remainder of his water—as much as he will drink—or water and *suttoo*, as the case may be. He may have a handful of dried *doob* grass to amuse himself with until he gets his feed. The syce now tidies up the stable, lays down the bedding, prepares and gives the corn. He should not spend more than a quarter of an hour over these preparations.

I strongly advocate the practice of putting dried grass before the horse at the same time that he gets his corn. A supply of fresh water should, if possible, be always left in the stall.

The stables are now closed till twelve or half-past, and the horses are allowed to rest undisturbed.

At noon the animal is lightly groomed, fed, and is left again to himself till four or half-past, at which time he is watered, groomed, and gets half a feed. After that, he is taken out and walked for an hour to an hour and a half. On returning, he is fed, clothed for the night, the bedding, etc., is put in order, and he is then left to enjoy his well-earned repose.

When a horse is galloped in the evening instead of the morning, the same routine should be observed, except that the afternoon's grooming should be commenced half an hour earlier. In this case, only a few "go-downs" of water should be given before it. Here, instead of being watered in the afternoon, he should be watered at mid-day, and then should have no more water, except the few "go-downs" already mentioned, till after work. When taken out, he should have, at the very least, an hour's walking exercise before his gallop, and after that he should get half a bucket of water, with a full allowance on his return to the stable. He is then groomed, fed, and bedded down for the night.

Supposing that a horse in training gets 16 lbs. of corn a day, it may be divided into feeds in the following manner:

			lbs.		lbs.
Early morning feed		..	1		0
Morning	„	..	4		4
Mid-day	„	..	4	or	4
Afternoon	„	..	2		2
Evening	„	..	5		6

CHAPTER V

MANAGEMENT DURING THE HOT WEATHER

In India the hot weather stops racing in the same manner as the winter does in England. During the months of April, May, and June, in fact until the rains commence, the trainer, if he be in the plains, should not do more with his horses than to keep them in healthy exercise, for the climate of itself will cause a considerable strain on their systems.

I am much averse to the plan of throwing sound, healthy horses altogether out of training during the summer when they are required for the following season's racing, for hard condition once lost takes a long time to regain, and the abrupt changes in the Indian seasons do not allow of a long period for strict training. Thus, if a horse be permitted to get gross or poor, and his muscles flaccid from want of exercise, and he be not put to work before the middle of July, it will be impossible to get him at all "fit" before November or December. I would, on the contrary, advise that a sound horse should get all through the hot weather a fair amount of healthy work which, when it consists of cantering and trotting, should be given in the early mornings.

Through these slack months any injuries that the horse's feet and legs may have sustained during the previous season should be carefully treated. On this subject it is sufficient to remark that *time* and *rest* are the best means to obtain repair of injured structures, and I would advise my readers to avoid heroic methods of treatment, such as blistering, firing, bleeding, and giving strong purgatives, except under competent veterinary advice.

During the hot weather horses should get a less quantity of food than when in training, though they should on no account be kept low, for if they be not liberally fed their systems will be unable to resist the debilitating effects of the climate. It is not from theory, but from what I have seen in practice, that I speak positively on this subject. An Arab may get eight, and an Australian ten pounds of corn—three parts oats, one part gram—with a couple of pounds of bran, and twice a week at night a feed of bran, or every second night a feed of boiled barley mixed with a pound of dry bran. A liberal supply of any green food which is obtainable should be given.

The chief point to be considered is that the dung should be properly formed—though that of some horses which have been trained a good deal always remains abnormally loose—brittle, devoid of all stickiness and bad odour, and should be of a healthy yellow colour. When oats are used the dung is much more yellow than with any other grain.

During the hot weather the horses should have an hour and a half's walking exercise in the morning, and a little less in the evening. It is preferable to have horses ridden at walking exercise than led. Almost every syce can ride well enough for this. Horses should be made to walk smartly. Nothing looks slacker or causes an animal to walk in a more slovenly manner than the way syces often lead horses, with a long rein or rope over their shoulder, while they hobble along in front at the rate of about two miles an hour.

CHAPTER VI

PRACTICAL TRAINING

Remarks on racehorses in India—Training quarters—General rules for work during training—Detail of work—Sweating—Remarks on training continued—Training by short repeated gallops—Remarks on training continued—Trials—Training ponies—Setting—Treatment after running—Racehorses travelling by rail.

RACEHORSES IN INDIA.—It is an old and true turf maxim that the better bred a horse is the more training will he stand. In India " blood " is rather an uncertain guide for the trainer, for many of the horses are " cocktails " in the strict English sense of the word. At the same time I must admit that the type of horse which Australia sends to India is improving yearly in quality and breeding, and that cases of giving " salt-water pedigrees " are becoming of rare occurrence.

The subject of pure blood and high caste in the Arab is one on which I have never been able to gain any exact information; nor do I think that any distinct rules as to external appearance can be laid down that would not equally apply to any other breed of horses intended to gallop fast, and " stay ", with a fair weight up. Many young Arabs which look unpromising at first, to our eyes, often turn out the best in the end.

These horses take a long time to mature, their powers rarely becoming fully developed before they are eight or nine years old, and until they have been raced for two or three seasons. On this account one should not lose heart because a likely-looking son of the desert does not answer one's expectations at an early date. Arabs can stand more work in India than any other class, and their *forte* is undoubtedly distance.

A young Australian, say a three-year old, appears to be, allowing for the difference between the dates from which they respectively take their age, nearly a year, a country-bred a year and a half, and an Arab two, if not three, years more backward than an English horse of the same age. Many three-year-old English horses are in their prime at the " back end " of the season.

Young Arabs especially, and indeed all young horses, may, with great advantage, be trained and taught to gallop without being brought to the post the season before they are actually run. We generally find a horse that has been raced the first year he has been trained, becomes in the next season from 10 lbs. to 1 st. better, not allowing for age, than he was during the preceding one. If horses are run the first year they are put to work they will rarely be able to contend successfully against platers, even when receiving, as maidens, from 7 lbs. to 1 st., simply because they have not had time to learn their business. We seldom see maidens which have been run thus come out in anything like their subsequent form until, perhaps, towards the end of the season, when there is little to be won with them, on account of the most important maiden races having been already decided. In England a young one can be kept at work for six months before he runs for his first two- or three-year-old events, but in India the hot weather allows but little more than three months during which to prepare a maiden, without suffering many of the best stakes which are reserved for his class to pass by uncontended for. We should not lose sight of the fact that it often takes more time to teach a horse to gallop than to get him into condition.

As it requires at least two years' conditioning to enable a horse to live amongst the first flight in "the Shires", it will certainly require no shorter period to bring a young one—probably fresh off the ship—fit to race over a distance in India.

Small, compact horses mature earlier than those of a larger and looser frame, and consequently may be run at an earlier age. Sluggish horses can almost always both stand work better and stay longer than impetuous ones. Old horses require usually less work to get into galloping condition than young ones do, though they take more *time* to put up muscle.

In India, horses are rarely trained specially—as in England—for one particular race, as there are few events worth an owner's undivided attention. In the former country, the usual practice is to give horses, within certain limits, more of a general than of a particular preparation. However, one should never sacrifice the speed of a flyer by giving him long-work, when it has been proved that, fit and well, he is unable to stay a distance.

Ponies, 13 hands and under, had best be trained for from a quarter to half a mile. Although there have been many instances—"Chieftain" and "Rex"—of Arab galloways being able to hold their own, at even weights, with Arabs of all sizes, still, in ninety-nine cases out of a hundred, allowance for height—3 lbs. the ¼ inch—will not bring a 13 and 13.2 pony together, nor the latter with one of 14 hands, provided the galloway has any pretensions to racing form. But if an owner happens to possess such a rarity, as were "Abdool Rayman" and "Rex", he had better train him for distances at which he will meet the class bigger than himself; for if the animal can succeed with them, he will have little difficulty in beating those of his own size, even in races shorter than those for which he was prepared.

For "all Arabs," 1¼ miles will be a fair average distance over which to train them. Half a mile less will usually answer for Australians and English horses.

Quite as much, if not more, depends on a horse's stable management, as on the work he gets, in bringing him fit to the starting-post. Many horses have been got into good condition, and have won important races, by being simply hacked, with now and then perhaps a canter on a soft bit of turf; or even by doing nothing more than trotting work in a very light trap, when their legs have been particularly infirm. But I doubt whether a horse has ever been brought within a stone of his proper form when he has been but indifferently looked after in the stable.

TRAINING QUARTERS.—The worst of the hot weather being over by the beginning of July, the horses may be put into steady work from that date. Before this, the owner should have made up his mind as to what he intends doing with them during the ensuing season; whether to run them early; to wait for some particular meeting later on; or to gradually gallop them into condition, as they work down country from one meeting to another, which is the usual plan adopted, as the different meetings are fixed to suit this arrangement.

To perform well on a hilly course a horse that has been accustomed to flat courses, ought, as a rule, to have at least a month's work on it, so as to "get the hill" into him. An instance of the beneficial effect of this practice was strikingly shown by the moderate "Malabar" (*p.* 171). I need hardly remind those of my readers who have had long experience in training, that a horse with naturally high action will require far less time to learn how to climb a hill than a "daisy-cutter." At Newmarket many horses are spoiled for races on level ground on account of having been given too much of their work up a hill (*p.* 172).

Perhaps the best thing to do with valuable horses is to send them at the close of the racing season (the end of March) to some semi-hill station, where, after a month or six weeks' rest, they may be hacked about with a light-weight up, and got into good working order, before being put into regular training. In this way they may be healthier and fresher than had they remained in the plains.

The practice of sending horses which have spent the hot weather and rains in the plains, as late in the year as September, to places close to the hills, is often accompanied by some risk, as the nights there are then getting cold—especially towards the end of that month—and animals whose livers are more or less deranged by the effects of the preceding hot weather, are very liable to get congestion of that organ from the sudden change of climate. (See *Veterinary Notes for Horse Owners*.) If an owner intends sending his horses to such places, I would advise him to do so before the hot weather commences.

It appears that the worst kind of climate for a horse to live in is a damp, hot one, like that of Bengal, for instance. A damp, cold climate, like that of Scotland, is not incompatible with the breeding of good horses, provided they be treated more or less as exotics. But the best of all is a dry, warm one. During the excessive heat of several hot weathers at Meean Meer and at Cawnpore, both of which places possess a very dry climate, I have never found that my horses suffered in any way from the great heat, as long as they were well protected from the direct rays of the sun, and had a free circulation of air through their stables. Although I do not say that horses will thrive quite as well during the hot weather and rains in the plains as in cooler climates, such as at Dehra Doon and Bangalore, still, I do not think the balance is very much in favour of them, especially when we take the cases of horses that it would be injudicious to train on a hilly course. In making these remarks, I again except all hot, damp climates, in which it would be most unwise to keep valuable horses during the trying months of the year.

Mozufferpore, possessing, as it does, a racecourse covered with soft and elastic turf, offers many advantages, but I question much if its climate is not too damp in which to summer horses. The same objection may, with still greater force, be urged against the Sonthal Hills.

General Rules for Work during Training.—Before a horse is put into training, he should, if possible, be in a sound state of health, and his muscles should be well developed by quiet, slow work and hacking.

If practicable, gallop only in the morning, and get the horses back early to their stables—not later, during the cold weather, than half-past eight o'clock. Apart from the fact that evening work, by exciting a horse, is apt to prevent him from having a good night's rest, we should remember that the ground, on account of the presence of the dew, is softest in the early morning.

I think, however, it is a mistake, as some do, to gallop horses too early in the morning—when it is all but dark, for by this practice accidents are liable to occur, especially from horses putting their feet into holes that are made by rats, which rodents burrow very rapidly on many of the Indian courses. Besides, too early rising deprives horses of a part of their valuable night's rest, and is apt to induce coughs and colds. I am rather inclined to think that galloping in the twilight is apt to make them " go higher " than they would do were they worked at a time when they could clearly see where they were going.

However backward in condition horses may be, they should not, except in very rare cases, be worked twice a day. Here I do not take into account their evening walk.

They should not get their gallop until they have walked for at least an hour, and cleared themselves out.

Horses which become much excited when brought on a racecourse, should have their work away from it as much as possible, and the place for their gallops should be frequently changed. When such animals have to be worked on a racecourse, they should be sent for their spin as soon as they arrive on the track, and should then be taken home without delay.

When training for a Monsoon Meeting, it is often desirable to gallop one's horses in the evening instead of the morning, for flies, which are fearfully annoying during the rains, are much less so in the former than in the latter time. Besides, if the course be far from the stable, the horses can rarely return before the morning sun is well up. A sweat, however, should never be given in the evening if it can possibly be avoided.

Before sending a horse a gallop his legs and feet should be examined, and if there be anything wrong, or the slightest heat present, he should be sent back to the stable. As a rule, unless a horse which is suffering from some injury actually goes lame, a syce will rarely inform his master of the accident.

A horse should be given a preliminary canter before sending him a sharp gallop, unless he be a very excitable animal.

The heavier topped a horse is, especially if he have a thick neck and coarse shoulders, the more careful should the trainer be about giving him fast work, particularly down any incline.

Horses should not be kept too long on hard food, and the trainer should never be afraid of giving them a bunch of lucern or a few carrots.

If a horse in strong work begins to leave much of his corn untouched, say anything over ¼ lb. at each feed, the chances are that he is getting too much work, which should be lessened, or altogether stopped, as the case may require; and he should have two or three bran mashes at successive feeding hours, some green food, or even an alterative ball, if he be at all "over-marked." The time a horse takes to eat his allowance of corn may be used as a measure of his appetite Thus, say a certain horse, who after work usually consumes his morning feed of 4 lbs. in 25 minutes, takes on a particular day half an hour to get through the same amount, the owner may reasonably conclude that he is a little off his feed. By observing such indications in time, the chances of over-working a horse will be materially lessened.

"It is well known to horsemen who are close observers that, though a horse cannot make a great race when decidedly off the feed, some of the finest efforts that ever were made, and some of the greatest successes that ever were won, came just as the horse was beginning to get dainty, and to pick and nibble at the oats." (Hiram Woodruff.)

A horse should never be fully extended earlier than a fortnight before the day on which he has to run, for, if this is done, he will be apt to get slow. Yet for all that, he should be sent along pretty fast, occasionally, during the latter part of his training, in order to vary the monotony of the work, "and to get the pace into him."

Avoid trying your horses against each other, or against the watch.

On finishing a gallop, always turn round towards the inside of the curve on which you are galloping. If the direction be in a straight line, turn in preference to the right-about, as you would on a right-handed course. This practice will tend to prevent horses learning to bolt off the course, for when they do so, they almost invariably go off towards the outside and not to the inside of it.

On a race-course, finish the gallop a couple of hundred yards beyond the winning-post, and then gradually pull up.

If a rubbing-down shed be used, it should be placed beyond the winning-post, and on the inside of the course.

One should avoid galloping horses in clothing, as it cramps their action, and the extra weight tends to shorten their stride and strain their legs.

I cannot help condemning the practice many adopt of having their horses galloped constantly in heavy clothing. An English jockey whose lowest riding weight is, say, 8 st., will, when not wasting, and when wearing warm clothes on a cold morning, weigh close upon, if not quite, 9 st. To this add 7 or 8 lbs. for the saddle, 2 to 3 lbs. for the bridle and martingale, and from 14 to 21 lbs. for the clothing, and we shall have the animal carrying about 11 st., which is a truly preposterous weight for a training gallop. And then men who allow this, will, when their horses become lame or get slow, wonder how in the world it occurred! If a trainer wants to get the fat off a horse, let him put clothing on, and give the animal his sweat a little later than usual in the morning, at a trot, or at alternate trots and canters, so that he may not spoil his action or risk his legs. When the horse is pulled up, let him be well covered over with rugs till the sweat trickles down his pasterns. And repeat every week or ten days this process, which will take the "beef" off the grossest horse quite quick enough. A trainer should consider the feelings of his horses; and it is only reasonable to suppose that an animal which is constantly exercised in heavy clothing must feel his movements cramped both by the weight he carries and by the presence of the rugs, and that he will consequently lose heart for the want of the exhilaration of spirits produced by a free and untrammelled gallop. The mind of the horse has undoubtedly a great deal to say to the quick, elastic stride, and the lightning dash of speed at the finish, exhibited by a well-trained racehorse.

Admiral Rous, in his book on *Horse Racing*, states that "generally speaking, racehorses ought to be galloped stripped all the year round, but comfortably clothed indoors suitable to the temperature."

One should have as light riding-boys as possible compatible with their being able to hold their horses together. Even with a screw, it is generally better to put up a stone or so extra, than to be obliged to employ a curb instead of a snaffle for his mouth, in order to enable a light lad to hold him.

If a horse can be held with a snaffle, never employ any other bit for him. Never use whip or spur in a training gallop, unless with a very sluggish horse, with one that is apt to bolt off the course, or with young animals that go awkwardly and require a deal of collecting.

The longer distance a horse has to go, the finer should he be drawn.

As a rule, do not have a less interval than ten days between each sweat. Rarely sweat later than ten days before a race, for a horse should have just enough time before running to be eased off, so as to get a little "above himself"; sufficient, in fact, to allow his nerves to regain their tone.

A horse should never scrape quite clean and watery sooner than the last ten days of his final preparation, for, if he does so, he is almost certain to become stale.

Assuming that a horse in training continues in good health and spirits, with his legs cool and fine, that he is never off his feed, and that his dung is in good order, we may safely be guided by the way he scrapes, after his morning gallop, in judging of the manner in which his condition is progressing, and whether he requires a sweat, or more or less work, so that his sweat may be gradually reduced down to the desired consistency. When a horse is gross, his sweat is thick and greasy to touch; but when he is in perfect condition, it is generally scanty, comes off as clear as water, and dries almost as soon as the scrapers have passed over the surface of the skin. He will then have the smallest amount of fat in his system compatible with his nerves remaining for *but a very few days* in good order. Of course he should be wound up to this concert-pitch only just before his race. I am here taking for granted that the animal is of the sort which bears being drawn fine.

When a horse, after slight exertion, breaks out into a watery and copious sweat and dries slowly, we may be pretty certain that he does so through weakness, and that he is in a most unfit state in which to continue training. In fact, what such an animal requires is, as a rule, a few linseed and bran mashes, some green food, and several days' rest.

Many excitable horses, when in perfect condition, will break out into a profuse sweat if brought on to a race-course. This should not be confounded with sweating from weakness or grossness.

The great thing to avoid is getting a horse fit too soon. Condition is only relative, for a horse may be in perfect training, although showing little muscle. What we want, however, is quantity as well as quality of muscle, with clean "pipes" and the "faculty of going" thoroughly developed. This desired state can only be obtained by work, which cannot be *continued* if the horse be prematurely brought too fine, for the consequent strain on his nervous system will be more than it can bear, and he will consequently soon become stale.

I think experience will bear me out in saying that country-breds, during training, can very rarely stand being galloped oftener than every second day. They should also be run "bigger" than any other class.

Horses differ so much in the way they stand work that it is impossible to lay down fixed rules on this subject. A writer on training can only give illustrative work and general rules, just as a whist authority may point out the proper leads and how to play certain hands. In both cases the inferences to be drawn and lessons to be learned will be only for general application.

In the following pages I shall consider the training of the average style of Australian we have in India, taking for granted that he continues sound and in good health. If a horse in training has a soft constitution, or has infirm legs, I must leave the trainer to exercise his own common sense to provide for the varying circumstances under which the uncertainty of horse-flesh may place him.

DETAIL OF WORK.—To proceed to the routine of training, one should first consider what length of time the horse has to get fit in before running. If there be five or six months, they may be divided into two periods, namely, preparatory work for about a couple of months, and the remainder actual training.

Before commencing any work, the horse may get the following alterative ball:

Barbadoes aloes	2 drachms.
Nitre	3 ,,
Tartar emetic	1 drachm.

Treacle enough to make a ball.

But if he be gross, or with not the best of forelegs to stand the work necessary to reduce his system, a physic ball (of four drachms of aloes and two of ginger) should be given. Before administering the medicine, the corn should be stopped, and bran mashes substituted for a couple of days.

I think the morning, say about nine o'clock, is the safest time to give a ball to a horse, and that there is then little chance of his becoming over-purged during the night, when help cannot be readily obtained.

The first month's exercise may consist of walking for a longer distance than the horse has done during the summer, say eight miles in the morning and four in the evening, varied every second day or so by a couple of miles trotting, or a slow canter for half a mile now and then. In fact, the work should not exceed gentle hacking. On commencing the second month, the trotting may be stopped, and slow cantering up to one mile substituted. This work ought only to take place in the morning, and should be gradually lengthened. The speed of the canter ought only to be just sufficient to keep the horse out of trot, or perhaps a very little more. During this month, no clothing should be put on at exercise, for the weather will be still very warm. On no account should the horse do more work than, in the morning, a slow canter after an hour's walking; and, in the evening, nothing more than a four or five mile walk. The morning work should be completed, and the horse back in his stable, before the sun is well up.

On finishing the canter, the horse should be pulled up very gradually, so as not to strain his fore-legs or hocks, and not until he has gone a couple of hundred yards beyond the winning-post—if on a race-course. He may then be turned round towards the *inside*, and trotted to the rubbing-down shed, where he is scraped and rubbed down (*p.* 185), or he may be walked home.

These canters may be given two or three times a week. On two other days, the monotony of the work may be broken by taking the horse out in the country, and then trotting, cantering, and walking him by turns for eight or nine miles. This will keep him fresh, and in good spirits; for he appreciates an "outing" and change of scene just as much as we do ourselves.

After these two months of preparatory work, the horse's muscles and sinews will have begun to harden, and he may now be put to regular galloping.

Want of preparatory work, before giving horses regular gallops, is but the too-frequent cause of break-downs.

The work I shall now consider is that which would be suitable for an ordinary Australian. An Arab's gallops might be a quarter longer. With him, a long slow gallop for two and a half or three miles might from time to time be substituted for the short "spurts." In timing, allowance should be made for the fact of the Arab's comparative slowness. Thus, for instance, a second-class Arab that could do at weight for age a mile in 1 min. 57 sec., *i.e.*, say 9 sec. worse than a second-class Colonial, ought, in a gallop at conventional half speed over that distance, to take about 15 sec. longer than would the Australian under similar conditions; for, of course, the difference of time between the two, at half speed, would be nearly double that between them when fully extended, the distance being the same in both cases.

It is not without considerable hesitation that I give illustrative timing; for I know well what a large margin must be allowed under varying conditions dependent on the style of horse, the weight he carries, and the state of the galloping track. I, therefore, crave the indulgence of my readers in the attempt which I make to furnish inexperienced amateur trainers, who are unable to obtain practical assistance, with a sound *general* idea of the nature of the work required to bring an ordinary racehorse in India fit to the starting-post.

At first the work should commence with slow canters, which may gradually be improved, say, after a couple of months, up to a little better than half speed. An ordinary Australian, unless, indeed, he be wanted for some particular distance, may commence at three furlongs every morning, and increase it up to a mile by the end of two months. Farther than this may make him slow. But if he is to be trained for races of only a certain length, then a third of that may be begun with, and he should gradually go up to three-quarters of the full distance. This may be varied once a week by a half-mile spin, somewhat quicker than the usual pace, in order to keep up the horse's "faculty of going." An off-day's hacking in the country will be of great service, as well as a slow gallop once a week for a couple of miles. For instance, the week's work might be divided in the following way, after the horse has been in regular training for a month and a half:

Monday	¾ mile, half speed.
Tuesday	hacking in the country.
Wednesday	½ mile, three-quarter speed.
Thursday	¼ mile, half speed, or walking.
Friday	¾ mile, half speed.
Saturday	1½ to 2 miles, slow.
Sunday	rest.

Besides the rest on Sundays, I would advise the trainer to give the ordinary Arab or Australian an extra day's rest once a fortnight in the middle of the week; and a bran, or linseed and bran, mash may be substituted for the usual feed of corn on the evening of the preceding day, just as if it were a Saturday. Horses that are at all shy feeders, or are easily upset by work, should have this extra day's rest every week.

What we call half speed is considerably faster than if the distance were done in twice as long a time as the horse could do it at full speed. A similar remark applies to conventional three-quarter and quarter speed. The latter is in reality about seven annas; half speed somewhat better than ten annas; and three-quarter speed about fourteen annas (adopting the custom of counting pace by annas: (see page 134). Thus, for a horse that can do his mile in 1 min. 48 sec., the time that he would take to do that distance at the different rates would be about as follows:

	min.	sec.
Quarter speed	3	50
Half speed	2	45
Three-quarter speed	2	5
Full speed	1	48

As a rule, a uniform pace should be maintained during each gallop; for nothing upsets a horse's style of going and temper more than "putting on the steam" the moment he enters the straight run in. Horses accustomed to this practice often refuse to extend themselves until their "heads are turned home", and then either bolt or run away. This, of course, would be fatal in a race.

The speed and distance of the weekly work which I have detailed should be gradually increased as the preparation proceeds. Thus, a second-class Australian, say one who could cover his mile with weight for age up in 1 min. 48 sec., might commence doing his half-mile gallops in 1 min. 45 sec., and towards the end of two months might do the three-quarters of a mile in 1 min. 50 sec.

During regular training, a horse should travel *about* twelve miles a day, including every kind of exercise. For instance, four miles before the morning gallop, which might be for one and a half miles, a one-and-a-half mile walk back to stable, and a five-mile walk in the evening: an amount which should be rarely exceeded, for long-continued walking makes horses stale and leg-weary. On days of rest, a five-mile walk in the morning, and a four-mile one in the evening will generally be enough. If a horse be gross, and have at the same time doubtful legs, I would prefer to trust to a mild dose of physic, say once a month, and a sweat, say once a week, given at a trot and a walk, alternately, late in the morning, than too-long-continued walking exercise.

At Newmarket, horses in training are usually kept out in the morning about two hours and a half; a period which is sometimes extended to three hours. Some trainers give them also a walk in the evening; while others take them out only once.

The usual practice at Newmarket is, after the horse has been walked for about three-quarters of an hour, to give him two canters of about three-quarters of a mile each, and then to send him for his gallop. Between the canters, and between the last canter and the gallop, the horse is walked back to the spot from which he first started. As in other details of training in England, no invariable routine is observed.

I have previously pointed out that the trainer must be guided by the manner a horse scrapes, in deciding as to the advisability of giving him a sweat; for at this stage of his work he will not be sent fast enough to try his lungs, so as to judge by their condition. During this time the sweat will be gradually losing its greasy feel, though it will still come off pretty thick. As it is impossible to give minute advice on this subject, I must leave the tyro to be guided by his own common sense, and by the general principles on which I have touched.

SWEATING.—Before describing the process of sweating a horse, I would ask my readers to remember that the grosser and more unfit the animal is, the slower the pace of the sweat, and the less severe should it be.

If time be limited, a stout, lusty horse will probably require a sweat, given at a slow pace, once a fortnight. English blankets only should be used, for their texture is closer and softer than that of other blankets. The clothes and distance may be arranged as follows:

Put a thick rug over the horse's back in the ordinary manner; then take a long blanket, fold it lengthwise in two or three folds, so that it may not be too broad, pass one end under the horse's belly to a man on the off side, make him draw it towards himself till it be properly divided, and pass the ends one above the other over the horse's back, so that the rug and blanket may be tightly wrapped round his body. A long blanket, folded like a shawl, is passed in front of the horse's chest, and well up his neck, so that it may not interfere with the action of his fore-legs; the ends are crossed over his neck, chest, and withers, and are brought down each side, under the place for the saddle, which is now put on, and which will keep his chest rug in its place. A couple of hoods—the underneath one having the ears cut off—will complete the clothing. The horse may now be sent on his journey, the length of which, as well as the amount of clothing, will depend on the style of the animal and on the heat of the weather.

If the sweat be given in September, October, February, or March, it will be quite enough to send a stout, hardy, well-bred horse two miles at a trot, or very slow canter, and another two miles at half speed, which would be about six minutes for the latter distance (taking into consideration the extra weight of the sweaters), and the pace may be slightly improved for the last half-mile. After this, he is trotted to his rubbing-down shed, the girths of the saddle are slackened, and he is covered over with more clothing for about ten minutes, or until the sweat begins to trickle freely down his legs, and drop from his fetlocks. If the trainer perceives by his laboured breathing that the horse is much distressed, he should lose no time in relieving him of the clothing, the hoods being first removed and the neck well scraped, wisped down, and dried; particular care being taken to dry the space between the jaws.

The saddle and blanket across the chest are taken off, and after that the body clothing. Each part, on being uncovered, is scraped and dried in succession. The horse should now get about a gallon of water to drink, and a suit of dry clothing, rather light than heavy, and suitable to the weather, being put on, he should be walked about for a few minutes, so that the trainer may see whether he will "break out" again or not. If this occurs, he should be stripped, dried, saddled, and ridden quietly about, in the direction of his stable, till he has cooled down. But if the animal shows no signs of breaking out, he should be led home to his stable without further delay.

During the colder months—November, December, and January—the distance may be increased.

With the clothing described, a five or six mile trot, or alternate trots and canters, will be sufficient for ordinary horses possessed of no remarkable gameness or stoutness.

Light-carcassed horses will not require sweating at all; as a four-mile gallop at half speed without clothing, or with only a hood, or one light suit, once a fortnight will be all that is generally required.

If, after a sweat, a horse refuses his corn, he should get some green food, such as carrots or lucern, during the day, a bran mash at night, no work next day beyond walking, and his regular gallops should not be commenced again until he has recovered his appetite and spirits. As a general rule, a horse should not be worked on the day following a sweat, which, for that reason, is usually given on a Saturday.

In the case of a lusty horse with doubtful fore-legs, it would be dangerous to trust alone to exercise to get him fine enough, or even to sweating in the ordinary way, which, from the extra weight carried, would try his legs too much. Such a one will probably require physic once a month, and once a fortnight a sweat, which may be given at a trot, or by trotting and walking alternately, and later than usual in the morning, so that the heat of the sun may aid the wasting process without entailing extra work on the legs. Gross horses with infirm fore-legs are always the most difficult to bring out; for the heavier they are above, the worse chance will their legs stand. On this account, before the trainer can venture to send them fast, he must get off some of the weight.

It is a matter of importance to have a light weight up when giving a horse a sweat; and, in order to obtain proper control, there is no objection to his using a curb, instead of a snaffle. If a lad rides much over 8 st. the pace should not exceed that of a trot.

In England trainers now rarely sweat their horses. Tom Jennings, who trained "Gladiateur", "Fille de l'Air", "Rayon d'Or", etc., once remarked to me, "If you send them fast enough, they'll want no sweating. The difficulty then will be to keep them big enough." This at Newmarket answers well, where the trainer has elastic turf, like that on the Limekilns, on which to gallop his horses, and where he can buy, without putting his hand into his own pocket, an unlimited number of yearlings to replace the older horses as they break down.

REMARKS ON TRAINING CONTINUED.—If, in the middle of the training, the horse appears at all feverish, or his legs inclined to inflammation from work and high feeding, he should be thrown out of work for a week, bran-mashed for the first two or three days, have some green food given, and an alterative ball administered. For three or four days after this, his corn should be diminished by one-half, and only walking exercise allowed.

During the third month of the preparation, the horse, if an Australian or English animal, may at first be sent a mile at about half speed, say in 2 min. 45 sec., the time and distance being gradually improved until he does 1¼ miles in, say, 2 min. 35 sec., which would be about conventional three-quarter speed. The short spin once a week may now be gradually increased to one of three-quarters of a mile. During the last month of training, the spin may be discontinued and a long gallop substituted, or an extra day's rest, in the middle of the week, according as the horse is found to stand his work. The speed of the regular 1¼-mile gallops may be gradually increased, up to the beginning of the last fortnight, to within 6 or 7 sec. of full speed; and no sweat should be given later than this. During the last fortnight, the trainer should be most careful not to overwork his horse, though he ought to wait till then before fully extending him. Two Sundays' rest, another day's extra rest between the fast work, with perhaps a day's hacking, two long slow gallops, six or seven fast ones, to be run at nearly, if not quite, full speed, and gradually working up to the distance that has to be run; a slow canter for three quarters of a mile, on the day before the race; and the race day itself will be a judicious division of the last fortnight. The fast gallops should not be given by racing horses against each other; for a very little of that kind of work will go a long way.

I have endeavoured, by using approximate times for the gallops, to give a general idea of what would be advisable with a sound, stout, second-class Australian, which, with 9 st. 7 lbs. up, could do, on a level course, his mile in 1 min. 48 sec., or 1¼ miles in about 2 min. 18 sec. But there is such infinite variety in the way different horses stand training, that it would be fruitless to give more than a general outline of the system to be pursued, with some hints and general directions which I hope may prove useful. All the same, however well up a man without personal experience may be in book lore on training, the chances are that he will ruin a horse or two in his first essay; but as soon as he gets some practical experience, he will quickly learn how to apply his book knowledge.

TRAINING BY SHORT REPEATED GALLOPS.—There are many horses whose legs would not stand the preparation I have described. With such animals, the trainer may adopt, with advantage, the system of short repeated gallops, instead of that of the ordinary long ones. For instance, in place of sending the horse a mile gallop, he might tell the riding-lad to walk him round the course to the half-mile post, and gallop him at the speed ordered, then walk him round to the same place, and gallop him as before. In this case, the muscles will have performed the same work as they would have done had the distance been one mile, and the suspensory ligaments would not have run a tithe of the danger of becoming sprained; for the time that these structures are peculiarly liable to injury is after the horse has begun to tire in his gallop (see *Veterinary Notes for Horse Owners*). At other times accidents rarely occur, except when a horse puts his foot on uneven ground or hits himself.

These repeated gallops may be commenced at a quarter of a mile, and be increased by degrees, say, in six weeks' time, up to three quarters of a mile.

At the shorter distances they may be given three times in a morning, and at the longer, twice; and the pace should be gradually improved, as the horse's system becomes braced and strengthened by exercise.

REMARKS ON TRAINING CONTINUED.—For a horse that can stand them, I think single gallops are, as a rule, best in India, taking into consideration the peculiarities of the climate, and the difficulty there exists in getting a sufficient number of riding-lads.

One should never forget that many horses run best untrained. These are, generally, light-carcassed, impetuous ones, which a sight of a race-course would upset for a fortnight. Such animals should be well looked after in their stable, get lots of walking exercise and quiet hacking, and have a gallop only once in a way—say, every ten days—and that away from a course.

Rogues or bolters should never be trained on a race-course, but should get their work hacking, pig-sticking or with hounds. One can often get a long stretch of soft ground by the roadside, or in the jungle, on which to extend a horse without letting him suspect that " business " is meant. Horses are extremely sharp in this respect, and know a great deal more about racing than we usually give them credit for.

At the risk of being laughed at, I positively assert that many horses know when they lose or win a race, and show this knowledge often most markedly by the way they look and carry themselves after running. I have frequently remarked that the once well-known Arab galloway, "Caliph", very seldom on the day of a race required a setting muzzle; for he would, of his own accord, neither touch his hay nor his bedding, and only just wet his lips in the morning, though he would take his allowance of corn all right. I believe the Arab "Sunbeam" had the same peculiarity. It may be asked how they knew they had to run on some particular day. Very easily, I should say, from the fixed routine they had been accustomed to at previous meetings—such as being plated, having their manes plaited, having a slack day on the previous one after several days of fast work, etc.—and from the appearance of the race-course, which made the fact manifest that races were about to come off.

Most platers on coming to the track of a strange race-course will plainly show that they know what it is. Then again, how many old race-horses know when to make their effort on nearing the winning-post, though some of them would probably "shut up" were they called upon earlier by their jockeys. How well a horse knows whether his rider has spurs on or not! Some will be as sluggish as a cow if they are absent, though were the Latchfords on they would be all life, even without being touched. Others will refuse to try if they get the slighest prick, and even when the jockey is without spurs they will require a few kicks in the ribs, just to show no punishment is meant, before they will consent to go "kindly."

There is always a difficulty about riding-boys in India. In England, stable-lads can either ride, or are capable of being taught; but among natives it is not the *custom*, and as it is very difficult to get lads, one is frequently forced to send horses alone, or, at most, in pairs. I am aware of the difficulty of finding a boy who has even a little idea of pace. In default of having such a one, I strongly recommend the amateur trainer to time every gallop, as well as each quarter of a mile of it, so that he may be able to correct the lad as occasion may require. To do this, one will require a good stop-watch, the best kind for this work being one which has a double second-hand so arranged that one of its branches can be made to stop at any moment, and by a second pressure rejoin its fellow, which in the meantime continues to go on, but which can be stopped, together with the other, at any moment. Thus each quarter of a mile can be accurately timed, as well as the entire gallop. With such a watch, the time of the second horse, as well as that of the first horse in a race, can be ascertained with precision.

Young horses should generally have a horse to lead them in their gallops, and should occasionally be allowed to draw level and pass the other on nearing the winning post. In doing this, the pace of the leader should be checked so as to allow the change of position to be made without an effort on the part of the youngster, who in this way will gradually learn his business, and towards the end of his training will be accustomed either to wait or to lead.

When horses are trained for short-distance races, as for half or three quarters of a mile, they may be run much bigger than were they intended for longer ones; and the trainer should avoid ever sending them long gallops except at a canter now and then, which will be less detrimental to their pace than gallops at, say, three-quarter speed for a mile or a mile and a quarter. They should have lots of walking and hacking. Three gallops a week over the short distance they will have to race will usually be enough. Another point is that, for short races, horses should never be galloped on a heavy course, as it teaches them to dwell in their stride and to lose the quick stroke in the gallop which is essential to speed. They should also be taught to start well and get quickly on their legs. To do this, the rider must have hands good enough to catch his horse by the head and send him " into his bridle " in a moment.

Trials.—In order to obtain a satisfactory trial, horses should only be tried when they are quite fit, which ought to be but a few days before the actual race comes off, unless the owner trains his animals specially for a trial, to see, for instance, if they be worth keeping for another season. The trial horse should be in every case equally well trained, and be one whose *present* (not past) public form is thoroughly well known to the trainer. Equally good jockeys should be put up or, in default, equally bad, and the trial should be ridden out as in a regular race, without favour or affection. Even with every precaution, trials are not always to be relied on, and a margin of 10 lbs. for mistakes would be little enough in the generality of cases, for very many horses perform differently in public from what they do in private. Besides, with a lot of horses in a race, one can never tell how it will be run, or what accidents may happen.

It is dangerous with horses that are at all shifty to finish a trial at some point before the winning-post on the course on which the race has to come off.

If an owner tries a lot of fresh horses, and finds but little difference between them, or at least between the best three or four, he may be almost certain that there is not a race-horse among them. According to Admiral Rous there is an average of about three remarkable runners in two thousand. There being so many failures among even English thoroughbred stock, it would be unwise for Indian owners of small strings to be over sanguine respecting the subsequent career of their likely though untried maiden Australians, Arabs, or country-breds. Trials between untrained horses are worth very little; because training makes a vast difference between animals of different stamps. Light-carcassed, impetuous non-stayers, who would probably never be fit for anything but selling races, would, perhaps, in a trial for a short distance, beat with ease an equally untrained race-horse which might require months of galloping to get fit. Really valuable horses, which can race and stay, are the very kind that require a long time and an enormous amount of work to develop their powers to the utmost; but impetuous non-stayers, that are often hardly worth their keep, will always be more or less in condition by dancing about and fretting whenever they are taken out of the stable.

I am very averse to trials as a general rule, for they are liable to upset a horse in his work and to cause accidents. With the best arrangements they are often very misleading as to the idea they give of actual form.

In the preceding pages I have considered the work a horse may get if there be five or six months in which to prepare him before he runs. If, however, the time be limited to only two or three months, a dose of physic on commencing will generally be required; for one must hurry on the work which, with high feeding, if physic be not given, is apt to upset a horse's system and make him feverish, thereby rendering his legs prone to inflammation. Pursuing the system I have already described, the horse will be put, without loss of time, into slow work, which may be increased up to a little beyond half speed by the time half the period allowed for training has elapsed. If the horse is well, and his legs fine and cool, no more medicine need be given, and the work can be continued as I have shown in the second preparation. But if the horse's system appear at all out of sorts, or his legs inclined to fill, an alterative or physic ball, as the case may require, should be given; and three or four days after the medicine has "set" work may be recommenced.

It will be a great assistance to an amateur unaccustomed to training to keep a diary in which to enter the distance and speed of the work done, and the amount of corn eaten, every day by each horse, with any remarks on their condition, etc., he may wish to note.

I have already gone fully into the subject of food, so shall not again notice it further than by saying that, in training, a horse's corn should be gradually increased up to the last two months, during which time he should have his full allowance, namely, as much as he can eat. If a horse's digestion gets upset by too much corn, it should be diminished, a bran mash may be given for a couple of nights, and some green food, such as carrots or lucern, substituted for a part of the corn.

The amateur trainer will do well to study the marks of good condition in the horse. Until by practice he is able to recognise them, he need not hope for much success in his efforts, for to train well one must have an educated eye to detect the minute graduations of condition, and, having acquired it, one will see at a glance what each horse lacks.

The most unerring sign of condition in an athlete is the fact of his being able to go through hard work without becoming thirsty. The horse-trainer will also find that as a horse gets fit the avidity with which he takes his water after his morning gallops will decrease, and that staleness is almost always accompanied by more or less thirst.

TRAINING PONIES.—Many ponies of 14 hands, and even smaller, will stand as much training as big horses. The famous 13.1 Arab pony, "Blitz", was a case in point. We shall generally find that the better bred (and consequently bigger, as a rule) a pony is, the more work will he bear. Blood English and Australian and high-caste Arab ponies may be trained according to the principles and routine which I have indicated for horses.

For ordinary country-bred ponies six weeks' training will generally be quite long enough, provided they commence in hard-working condition. As a rule, they should not be galloped oftener than twice a week, nor farther than half a mile, except when the distance they have to run is much longer, in which case they may be sent on an extra bit. Sweating and long, slow gallops should be avoided, and I would advise that the pace of the work should be kept pretty brisk.

In some parts of India, as in Cachar, only ponies are used for racing, and are often asked to go long distances, frequently over a mile. Let us suppose a country-bred pony to be trained for a race of that length, and that he has six weeks in which to get fit; I would then recommend something like the following preparation:

First Fortnight.—A gallop at half speed on Mondays and Thursdays for a quarter of a mile, twice on the same morning, with a walk for a mile between the spins.

Second Fortnight.—Single gallops on the same mornings, commencing at half a mile, and going up to three quarters of a mile, improving the pace up to three-quarter speed.

Last Fortnight.—Four gallops, a little better than three quarter speed, for something under a mile.

On off days the pony should have a fair amount of exercise, hacking, etc., which, I think, should not exceed 9 or 10 miles a day.

If an owner has a real "glutton" for work, he may take liberties with him, but country-bred ponies usually are not of that sort.

SETTING.—The degree of "setting," which term is used to express the routine employed in stinting a horse of his food and water before a race, will depend on the distance to be run, the time of day at which the horse is to come to the post, and on the condition and constitutional peculiarities of the animal itself. The longer the race is the sharper should he be set. If it is to come off in the morning and the horse be gross, on the previous day he should get only about three pounds of hay or dried grass, given in quantities of one pound each after his morning, mid-day, and evening feeds, the muzzle being put on to prevent him eating his bedding. The evening feed may be slightly decreased, and the early morning feed of one pound should be given three hours before the race comes off. In this case no change in the system of watering on the day preceding the race is needed.

Water is very rapidly absorbed into the blood, an- on that account, when taken in moderation a couple of hours or so before a race, it does not act as a mechanical obstruction to the organs exerted in violent exercise, nor does it occupy the functions of the digestive apparatus in its assimilation, for a considerable time, as corn would do. For these reasons one should not stint a horse so sharply in the matter of water as in that of food.

If the races be held in the evening, the setting need not be so strict, and an allowance of, say, six pounds of dried grass may be given the day before.

The trainer will now be guided by the style of horse whether to put on the muzzle the night before the race or to wait till the next morning. In most cases I think it better to adopt the latter method, for if the muzzle be applied overnight there is a great probability of the horse getting fidgeted by it, and thereby being prevented from having a good night's rest. Anyhow, on the morning of the race he is given his usual one-pound feed, and is taken out for an hour and a half's walk, or he may get a very slow canter for three-quarters of a mile, and be sent the next quarter at nearly full speed, just to open his pipes and to give him the idea that his day's work is finished. After that he may get about half his allowance of water, and nearly his full feed of corn, with a small handful of dried grass. The muzzle is now put on, and at noon he may get a couple of pounds of corn. If the race comes off about four o'clock, he should get nothing more, but if at a later hour, a double handful of corn may be given three hours, or three hours and a half, before the saddling-bell rings.

If a muzzle does not irritate a horse, it is better to use one than to take up the bedding, without which most horses will not lie down during the day, and many will abstain from staling much longer than they ought to do. On the day of the race, the grooming should be got over quickly, for the horse should be disturbed and excited as little as possible. For the same reason, I would never plait the mane of an excitable horse. I may remark that the use of plaiting the mane is to prevent the hair flying about and getting entangled with the fingers of the rider while he is holding the reins, especially when he wants to shorten his grip on them.

Having arrived at the racecourse, the horse should be kept walking in the shade, if possible, and the saddling should be done quietly, and without any fuss. I think it is advisable for the owner to look after this operation himself, and to see that the weights, girths, stirrup-leathers, etc., are all right. The horse gets now, from a leather-covered soda-water bottle, just enough water to rinse his mouth out, the jockey is given a leg-up, the syce dusts the jockey's boots down, and off they start for the post, where, in case of accidents, a syce should always go, and should take a spare stirrup-leather and girth ; for such things sometimes break at false starts. Besides this, the jockey may have to dismount in order to arrange some part of the gear, and may require the syce to hold his horse, or to lead him up to the starting-post in case he is fractious.

TREATMENT AFTER RUNNING.—A horse should be watered immediately after a race, and, if he be much distressed, he may get 1½ oz. sweet spirits of nitre in a drench, or 2 drs. carbonate of ammonia in a ball. If he has not to run for five or six days, he may get a bran mash or two. But if a fortnight or more is to elapse before his next race, he may have an alterative ball, and be kept on green food for a couple of days or more. His legs and feet may, with advantage, be fomented after running.

RACEHORSES TRAVELLING BY RAIL.—It may not be out of place to say that when racehorses are taken by rail, during the cold weather, their tails (when they are in the horse-boxes) should be pointed towards the engine, so as to obviate, as much as possible, the chance of the animals catching cold.

CHAPTER VII

RACE-COURSES

On keeping a galloping track in order—Effect of ground on horses—Measuring courses.

THE climate and the hardness of the ground are the two great difficulties which a trainer has to contend against in India. When a race-course is on the ordinary soil found in this country, having generally a sub-stratum of *kunkur*, nothing but constant manuring and picking up can keep it in order. This costs so much that the clerk of the course (unless the race fund be particularly rich) may be well contented if he can keep a galloping track, even if only four yards broad, in good going order all the year round. Just before the close of the rains, he should take advantage of the softness of the ground to plough it up. If the ploughing be delayed, nothing but the pick-axe will touch hard soil. When arranging coolies for picking up ground, it is a good plan to have two men to each pick-axe, or hoe (*phurwa*), so that one may relieve the other. They will, alternately, pulverize the clods with a wooden batten (*mungurree* or *tapee*). The cost of labour may be calculated as follows:

On the hardest *kunkur* soil, a coolie, using a pickaxe (*gyntee*), can pick up and pulverize about 30 square yards, 4 to 6 inches deep, a day; or, with a hoe, he can dó about 40 square yards of ordinary hard, sun-baked soil, or 60 square yards of easy soil. The clods should be pulverized as the picking-up proceeds; for if left for a few days exposed to the sun, they will become almost as hard as so many stones. The best pick-axes for this work are those supplied by Government to regiments among their entrenching tools. Litter or tan should now be put down without delay. It is no use applying them before the ground is thoroughly loosened; for, until it becomes so, manure would have as little chance of working into and amalgamating with it as it would on a metalled road. On a track four yards broad, such as described, it would take 2,000 maunds (1 maund = 82 lbs.) of tan, or 1,500 maunds of litter, to lay down a mile properly. The cartage of this will amount to a few rupees a hundred maunds, when brought from a distance of a few miles. The spreading of the litter or tan will come to a few annas a hundred maunds. Litter can sometimes be got from artillery, cavalry, or elephant lines for the mere carting of it away; but, when it is sold, its price will not usually exceed eight annas a cart-load of about twenty maunds. Old and thoroughly decomposed litter is the best. New litter always contains a large quantity of particles of undigested corn which have passed through in the dung of the horses. The presence of this grain will generally attract numerous field-rats, that will burrow all over the course, and thus give a great deal of trouble before they can be exterminated, which is best done by filling the holes with water, and killing the rats as they come to the surface.

The Indian sun bakes the earth hard, and seems to burn up in a very short time whatever kind of manure is put on it; so that nothing but constant picking up and laying down litter, sand, or tan at least twice a year will keep a galloping track in anything like good order.

A track 5 ft. broad will be found to be quite wide enough on which to work a horse by himself.

By constant manuring, a thin layer of good soil will in time be formed; but if the course be neglected for even a couple of years, it will become as hard as a turnpike road.

The *beau ideal* of a galloping track is an elastic one, that will not jar the joints and suspensory ligaments by its hardness, strain the back tendons, or cause a horse to hit himself by its stickiness, as on soft clay, or shorten the stride and make it dwelling by deadness, as we find with sand.

A heavy course is particularly trying to a horse with oblique, and a hard course to one with upright, pasterns. Irregularities on the surface of the ground are a frequent cause of sprain to tendons and ligaments.

A galloping track such as I have mentioned, and 1¾ miles round, will cost several hundred rupees a year to keep in good going order.

The periphery of a race-course, for big horses, should not be less that 1¼ miles. One of 5 furlongs will do for small ponies.

A *distance* is 240 yards.

On a race-course where horses are trained, one should erect a rubbing-down shed beyond the winning-post, and on the inside of the course. These sheds are made of split bamboo and dry thatching grass (Hind. *phoos*). A couple of stalls, roofed over in case of rain, with a small enclosure in front to keep off people troubled with curiosity, will cost a few rupees. *Ghuramee* (thatcher) is the name given to the labourers who do this *chhuppur* work.

There should be, near each stand, a piece of ground carefully flagged and made level, on which to measure horses.

Race-courses are supposed to be measured on a line 5 ft. from the inner edge all round; but practically the best plan is to measure close to the inside, and then add to the length obtained 10½ yds., under the assumption that the course is a circle, which is near enough for all practical purposes. This mathematical problem I leave to my readers to work out for themselves.

If horses are obliged to be galloped on the outside, on account of the inside being closed, the increased distance once round, which might require to be done in the event of a trial, may be readily calculated. For instance, say that the gallop is to be taken 25 ft. from the inside, *i.e.*, 20 ft. outside the line on which the course was measured, then the increased distance would be four times 10½ yds., viz. 42 yds.—in fact, we add 10½ yds. to the length of the course for every 5ft. the galloping track is outside the line on which the course was measured.

A surveyor's large perambulator is more correct and expeditious than the ordinary chain.

As a rule, courses in the morning give about a couple of seconds slower time for a mile than they do in the evening.

I believe that the Bangalore course, for 1¼ miles, is about 6 seconds slower than that of Madras.

The 1¼ miles at Dehra Doon is very little slower than that on an ordinary flat track; but the mile is quite 2 seconds slower.

Races over three quarters of a mile at Lucknow generally give bad timing, owing to the slight hill, for about half a mile, which leads up to that post.

The Calcutta, Sonepore, and Meerut courses are very fast.

All large stands ought to be inclined to the racecourse at an angle of about 30 degrees, so as to enable every one to have a good view. They ought to face the east if for evening racing, and the west if for meetings which are held in the morning, in order that the occupants may not suffer from the glare of the sun. The inclination I have mentioned is that which was given to the Cesarewitch stand at Newmarket, and is the one recommended by my friend Mr. William Manning.

CHAPTER VIII

STEEPLECHASE COURSES

In order to test fairly the jumping as well as the galloping capabilities of horses, the fences ought not, on an average, to be further apart from each other than 400 yards. As remarked by the brilliant horseman Mr. Bertie Short, the first third of the course should consist of broad, low, and somewhat easy obstacles, which would not be liable to bring disaster on the competitors before they have settled down to their work. The fences in the middle third should be such as to test thoroughly the jumping powers of the animals, so that the gallopers may not have it all their own way; and those in the final third should become gradually more and more easy towards the finish, so that they may not be likely to bring down a tired horse which may happen to chance them a little. I may remark that such an arrangement can seldom be carried out in its entirety, although we may preserve its general character on a more or less circular line of country. Thus, supposing the course is 2 miles round we may, to get 3 miles, make one half easy, the other stiff, the first and final miles being over the same ground. The fences should be as long as possible, especially the first and second, as very dangerous accidents are liable to occur if the horses have not plenty of room when they are excited. After they have once settled down, they are not so likely to run out or go crooked as they were at first. Besides this, some are almost certain to " tail off."

On the majority of Indian steeplechase courses, the ground, for, say, 25 yards. in front of each obstacle, will require to be watered in order to lay the dust effectually, so that the horses behind the leaders may see what they are required to leap. The landing side should be made soft for about the same distance, so as to save the horse's fore-legs, and also to take the " bone " out of the ground in case any of the animals fall. The opposite extreme of making the ground deep and " holding " on landing should be carefully avoided. Stiff and solid fences, such as walls, should never be placed in a position which will cause their shadow to fall on the taking-off side. In other words, the horse which has to run in the afternoon should meet no obstacle of this kind when going in a westerly direction ; for, if he does so, he will be apt to jump as if the shadow represented a yawning drain, which, in such cases, he probably thinks it is, and will then be liable to strike the fence and come down. The terrible and fatal accident which occurred at Dehra Doon to poor Jack Irving, one of the best jockeys I have ever seen, was caused in this manner. The same rules should be observed with regard to water-jumps ; for, as remarked by Mr. Short, " the sun shining from the front on water is very dazzling to horses coming up fast."

The following are the usual kinds of fences met with on Indian steeplechase courses:

1. Hurdles, 3 ft. 6 in. high, and bushed with brushwood.

2. Bush fences, 3 ft. to 4 ft. high, and 8 ft. or 10 ft. broad at the base. Care should be taken that the material used does not contain long, sharp-pointed thorns, which often inflict severe injuries on the legs of horses that may happen to chance such obstacles.

3. Hedges, from 3 ft. to 4 ft. high. Quick-set hedges, which form the majority of the jumps on the Aintree course, over which the race for the Grand National is run, are seldom met with in India, except at Dehra Doon, where they consist of rose bushes. A weak hedge should never be stiffened by a rail, unless the wooden bar is placed in such a manner that the horse cannot help seeing it. Neglect of this precaution was the cause of the death at Liverpool of the famous gentleman rider "Mr. Edwards" (George Ede).

4. Walls: These are usually made of mud; and, in my opinion, should not exceed 3 ft. 9 in. in height, if upright. The great fault made about mud walls in India is that they are often left in their ordinary brown condition, in which case they do not always stand out sufficiently sharply from their dingy surroundings to enable a horse coming at them to measure his distance accurately. At least, on the taking-off side, they should, if possible, be turfed over (with roots of *doob* or *hurryalee*), and kept watered for several days previously. We must remember

that the afternoon glare on an Indian race-course is often very deceiving to a horse's eyes. The wall, on the taking-off side, should have a slight slope, say ¼; in which case the wall may be made 4 ft. high as a maximum. Such a wall is quite formidable enough without having any drain in front of it. An obstacle like this should on no account be topped with brushwood or other covering; for, if this be done, the horse will be very liable to chance the fence on account of the false impression its appearance is likely to give him. I have seen most regrettable accidents occur from horses being thus culpably misled by constructors of steeplechase courses. The stiffer a jump looks, the more likely is the animal to be careful when negotiating it.

5. Posts and rails, which may be made 3 ft. 6 in. high. I have always insisted that the top bar should be made very thick, so as to plainly show the horses that they cannot chance it successfully. I think it is best to leave the post and rails unbushed.

6. The water-jump, which may be about 13 ft. broad, having a small hedge or bushed fence about 2 ft. high in front of it. It need not be more than 2 ft deep. Its far side should slope up at an angle of about thirty degrees. Long ago water-jumps with straight-cut sides used to be a prolific cause of broken backs among steeplechase horses.

It frequently happens that, on filling an artificial water-jump, the water soaks through the soil, and renders the landing so soft that a horse jumping on to it at speed will probably come down. Such a contingency may be obviated by putting down a few rows of *kurbee* or reeds, and covering them over with earth, so as to form a firm place for the horse to alight on.

7. An Irish bank, which may be 3 ft. 6 in. high, 6 ft. broad on the top, having sides sloping down at an angle of about forty-five degrees, with ditches of about 3 ft. broad on each side. If possible this bank should be turfed over, as before described.

8. An in-and-out, or lane, consisting of two fences (hedges or walls) placed about 30 ft. apart.

The character of hedges, bush fences, or walls, may be varied by placing ditches on either side of them. Such a ditch should not be more than 4 ft. broad and about 2 ft. deep. When it is placed on the near side of the fence, it is advisable to make the ground for, say, the last couple of feet, slope slightly up to the edge of the drain, so as to show the horse what he has to expect. In England, ditches have usually their sides more or less raised, on account of a portion of the mud, etc., when they are cleaned out from time to time, being thrown up on the edge of the drain.

The following might be taken as a fair average line of country for a 3½ mile steeplechase:

1. Flight of hurdles.
2. A broad bush fence, which may be safely chanced.
3. A hedge.
4. Water-jump.
5. Posts and rails.

6. Sloping wall, 4 ft. high.

7 Wall 3 ft. 6 in. high, with a ditch in front of it.

8. An Irish bank.

9. An in-and-out, consisting of a wall 3 ft. high, with some brushwood on the top, and a 4 ft. drain in front of it. The second fence may be a hedge.

10. A wall 3 ft. high, with brushwood on the top.

11. Hedge with ditch on far side.

12 and 13. Hedges.

14. Flight of hurdles.

The " run-in " may be about 500 yards long.

It should be pointed out that it is inadvisable to start horses at a considerable distance from the first jump; for, by the time they will arrive at it, they will probably be racing against each other, and will consequently take far longer to settle down to their work than they would do were they started, say, 150 yards from the obstacle.

Stewards of a meeting at which steeplechases are run should be most particular to have the jumping events decided while there is plenty of daylight.

HINDUSTANEE STABLE AND VETERINARY VOCABULARY

THE following, with the exception of names of diseases, colours, and some technical expressions, are words which any syce will understand and which are in common use in the stable. In order to render the pronunciation easy to those unacquainted with the language, I have written the vowels as they are pronounced in the following words:

a as in "star"
é " "écarté"
i " "kin"
o as in "tore"
u " "fun"
ú " "pull"
oo as in "poor"
ow " "town"
y " "by"

n should be pronounced like the French nasal *n*, as in "*mon.*" The Hindee letters *t*, *d*, and *r* are pronounced hard, as in English, and the *th*, *dh*, and *rh* as these letters would sound if aspirated; *kh* and *gh* stand for these two guttural letters in Arabic.

PARTS, ETC., OF THE HORSE.

Abdomen, *Pét.*
Acid, n., *Tézab.*
Aconite (A. ferox), *Mahoor.*
Aged (horses ten years old and upwards), *Mulé punj.*
Aloes, *Músubbur*; *élwa.*
Alum, *Phitkurree.*
Amble, to, *Ruhwar chulna.*
Anasarca, *Tubuk.*
Anise-seed, *Sownf.*

Antimony, black, *Súrma.*
Anvil, blacksmith's, *Nihai.*
,, shoeing smith's (small) *Sundan.*
Aphthæ, *Unchhur.*
Arab horse, *Tazee,* or *urubee ghora.*
Areca-nut, *Súparee.*
Arsenic, red, *Mynsil.*
,, white, *Sunkhea.*
,, yellow, *Hurtal.*
Artery, *Shiryan.*
Asafœtida, *Heeng.*
Asthma, *Duma.*
Axletree, *Dhúree.*

Back, *Peeth.*
Backband, *Barkush.*
Backbone, *Reerh.*
Back tendon, *Ghúr-nuss.*
Bag (for grain, etc.) *Bora.*
Ball (physic), *Duwa kee golee.*
Balling iron, *Daroo-kush.*
Bandage *Puttee.*
,, (wet), *Pochara.*
Barbs, or paps, *Unchhur.*
Barley, *Jow.*
Bars (of the hoof), *Dobree-pútlee.*
Bar-shoe, *Gol-nal.*
Bay, *Kúmyt.*
,, with legs which are black up to the knees, *Seeah zanoo kúmyt.*
,, with belly and inside of legs light coloured, *Kúhur.*
Beans, *Sém.*
Bearing rein, *Gol bag.*
Bedding (straw), *Bichalee.*
Belly, *Pét.*
Belly-band, *Pétee.*
Bile, *Pitta.*
Bit (curb), *Duhana.*
Bite, to, *Katna.*
Biter (a horse), *Kuttur.*
Black, *Múshkee ; kala.*
Bladder, *Phúknee.*
Blanket, *Kummul.*
Bleed, to, *Fusd kholna.*
Blind, *Andha.*
,, of one eye, *Kana.*
Blinkers, *Putta.*
Blister, *Chhala.*
Blood, Kh*oon.*
Blue stone, *Neela tooteea.*
Bobtailed horse, *Bunda,* or *lundoora ghora.*
Body (of a carriage), *Howda.*
Body piece (clothing), *Gurdunnee.*
Boil, n., *Phora.*
Bolt, to (off the course), *Phut jana.*
Bone, *Huddee.*
Borax, *Sohaga.*
Bots (eggs), *Leek.*
,, (larvæ), *Bur.*
Brain, *Mughz ; bhéja.*
Bran, *Chokur.*
Breast-piece, *Chhatee bund.*
Breast-plate, *Pésh-bund.*
Breechen, *Púshtung.*
Breeding district, *Khét.*
Bridle, *Lugam.*
Brittle feet, *Súmkhara.*
Bronchitis, *Kuf.*
Brook (steeplechase), *Nala.*
Broom, *Jharoo.*
Brow-band, *Kun-sirra.*
Brown, or dark bay, *Téleeya kúmyt ; lukhowree kúmyt.* Natives call light brown, *kúmyt* (bay), and dark brown, *múshkee* (black).

Bruise, n., *Chot*.
Brush, n., *Koochee*.
,, to, *Néwur lugna*.
Buck, to, *Kandhee marna*.
Bucket, *Baltee*.
Buckle, *Buksooa*.
Butteris (shoeing), *Súm turash*.

Calkin, *Khoonta*.
Camphor, *Kafoor*.
Canker of the foot, *Kufgeera*.
Cannon bone, *Nullee*.
Canter, to, *Poya chulna*.
Capped elbow, *Kheesa*.
,, hock, *Kúbneea*.
,, knee, *Zanooa*.
Caraway seeds, *Ajwyn*.
Carbonate of soda, *Kharsujee*.
Carrots, *Gajur*.
Cartilage, *Kurree bu*ddee.
Caster (horse), *Nuzuree ghora*.
Castor oil, R*én*dee *ka tél*.
Cataract, *Moteea-bind*.
Catarrh, *Zúkam ; surdhee*.
Catechu, *Kuth*.
Caustic, *Tooteea*.
Chaff, *Bhoosa*.
Chalk, *Khuree mittee*.
Chamois leather, *Sabur*.
Cheek, *Gal*.
Chest, *Chhatee ; seena*.
Chestnut (all over), *Súrung*.
,, with dark mane and tail, *Kúmyt*.
,, dark, *Mowha súrung*.
,, with light mane and tail, *Chowdur Súrung*.
Clean, *Saf*.
Cleft of the frog, *Pútlee kee ghaee*.
Clench of a nail, *Púchee*.
,, to (a nail), *Mé*kh *ko púchee kurna*.

Clip (of a shoe), Th*okur ; killif*.
Clothing, light, Th*unda kupra*.
,, warm, *Gurm kupra*.
Clyster pipe, *Pichkaree*.
Cold (adj.), Th*unda*.
Cold in the head, *Zúkam ; surdhee*.
Cold chisel, *Chhénee*.
Colic, *Kúrkúree*.
Collar (harness), *Hulka*.
Colours, racing, *Ghúrdowree Kupra*.
Colt, *Buchhéra*.
Comb, *Kunghee*.
Condiment, *Musala*.
Constipation, *Kubz*.
Consumption, Kh*ushkhel*.
Copper, acetate of, *Jungal*.
Corn (injury to foot), *Chhala*.
Corn (grain), *Dana*.
Corners of the mouth, *Bachh*.
Coronet, *Bhow*n, or *súm kee mughzee*.
Corrosive sublimate, R*uskapoor*.
Cough, *Khansee*.
Country-bred horse, *Désee ghora*.
Cow dung, *Gobur*.
Cowkick, to, *Kainchee marna*.
Cracked heels, *Chheewur*.
Cream-coloured (horse), *Doodheeya shirg*ha.
Crib-biter, *Howapeené-wala*.
Croton bean, *Jumalgota*.
,, oil, *Jumalgoté ka tel*.
Crupper, *Dúmchee*.
Crust of the hoof, *Sha*kh.
Curb (a bit), *Duhana*.
Curb (an injury), *Bujr bu*ddee.
Curb-chain, *Duhané kee zunjeer*

Currycomb, *Khurara*.
Cyst, *Jowa*.

Dandriff, *Roosee*.
Defect (in a horse), *Ayb*.
Diarrhœa, *Dust*.
Digest, (to food), *Huzm kurna*.
Dirty, *Myla*.
Dismount, to, *Uturna*.
Ditch, *Khaee*.
Dock (under the tail), *Saghiree*
Door, *Durwaza*.
Double bank (steeplechase), *Dum duma*.
Drench, to, *Duwa pilana*.
Drink, to, *Peena*.
Drive, to, *Hankna*.
Dropped hip, *Kum koola*.
Dropsy, *Tubuk*.
Dull, to be, *Sust hona*.
Dun, light all over, *Shirgha*.
„ with dark mane and tail, *summund*.
„ with black stripe down the back, *Sélee summund*.
„ with dark points and black horizontal stripes on forearms, *Killa*.
„ with zebra marks, *Kéburee Killa*.
„ with legs black up to the knees, *Seeah zanoo summund*.
Dung, *Leed*.
Dysentery, *Péchish*; Khoonee *dust*.

Ear, *Kan*.
Eat, to, *Khana*.
Elbow, *Aglee Kohnee*.
Elephantiasis, *Feel-pa*.
English horse, *Bilayutee ghora*.
Enteritis, *Boghma*.
Entire (as a horse), *Andoo*.
Epilepsy, *Mirgee*.
Eye, *Ankh*.
Eyelash, *Buronee*.
Eyelid, *Puluk*.

Farcy, *Bel*.
Farrier, *Saloturee*.
Fast (swift), *Téz*.
Fat, n., *Churbee*.
„ adj., *Mota*; *furba*.
Feather in the hair, *Bhownree*.
Feeder, a bad, *Kum* khor.
Felloe, *Putee*.
Fetlock, *Mŭttha*.
Fever, *Tup*; *bŭkhar*.
Fibre (of muscle, etc.), *Résha*.
Fill, to (as a leg), *Py ajana*.
Filly, *Buchhéree*.
Fire, n., *Ag*.
„ to, *Daghna*.
Fistula, *Nasoor*.
Fit (in training), *Taiyar*.
Five year old, *Punjsala*.
Flank, *Kokh*.
Flat (race), *Suffart*.
Flat-feet, *Chŭpatee sŭm*.
Flatulency, *Badee*.
Fleam, *Nushtur*.
Flour (coarse), *Ata*.
„ (fine), *Myda*.
„ (very fine), *Soojee*.
Foal of one month, *Kurra*.
„ of four months *Sinaya*.
„ of eight months, *Wastat*.
„ to be in, *Gabbin*.
Foam from the mouth, *Kuf*.
Foment, *Sénkna*.
Foot, *Pyr*.
Foot and mouth disease, *Kúrpuka*; *khúrba*.

Foot-board, *Paondan.*
Forage, *Chara.*
,, daily allowance of, R*atib*
Forearm, *Bazoo*; *dund.*
Forehead, *Matha*; *péshanee.*
Fore-leg, *Hath.*
Fore-lock, *Chotee.*
Forge, *Mistree*-kh*ana.*
Four year old, *Charsala.*
Frog, *Pútlee.*
Fullering (of a shoe), *Punalee.*

Gallop, to, *Dowrna*; *surput phénkna.*
Garron, D*ugga.*
Geld, to, *A*kh*ta kurna.*
Gelding, *A*kh*ta.*
Ginger (dry), *S*onth.
,, (green), *Udruk.*
Girth, *Tung.*
Girth-gall, *Zér tung z*ukh*m.*
Girth-tug, *Chheep.*
Glanders, Kh*unak*; *seembha.*
Gloves of hair for grooming, *Huthee.*
Go-down (of water, etc.), *Ghoon*t.
Goose-rumped, *Tubur goon.*
Gram, *Chuna.*
,, (Madras), *Kúlthee.*
Granulate, to, *Angoor bhurna.*
Granulations, *Angoor.*
Grass, *Ghas.*
Grass-cutter, *Ghuseeara.*
Grass lands (preserved), R*ukh.*
Graze, to, *Churna.*
,, to send to, *Churana.*
Grey or white, with dark mane and tail, *Subza.*
,, flea-bitten, *Mugsee.*
,, dappled, *Gúldar subza.*
,, iron, *Neela subza.*
Grey nutmeg, *Lal subza.*
Grey, with skin black and white in patches, *Sunjaf.*
Grind coarsely, to, *Dulna.*
,, finely, to, *Peesna.*
Groom, *Saees.*
,, to, *Malish kurna.*
Gullet, *Hulk.* This word is also applied to the windpipe.
Gums, *Musooré.*

Hair (of the mane and tail), *Bal.*
,, (of the body), R*oan*; *rom.*
Half-bred (horse), D*og*h*la.*
Halter, *Núkta.*
Hames, *Huslée.*
Hammer, shoeing-smith's, *Huthowree.*
Handful (double), *Unjul.*
,, (single,) *Mút*th*ee.*
Hand-rub, to, *Hath sé mulna.*
Hard-mouthed (horse), *Moobzor.*
Harness, *Saz.*
,, (double), *Joree ka saz.*
,, (single), *Ekla saz.*
,, (tandem), *Agul pichul saz.*
Haw (of the eye), *Butana.*
Head, *Sir.*
Head-collar, *Núkta.*
Head-groom, *Jumudar saees.*
Head-rope, *Agaree.*
Head-stall (of a bridle), *Sirduwalee.*
Heart, *Dil.*
Hedge, *Bar.*
Heel (of the hoof), *Khoontee.*
Heel-rope, *Pichharee.*
Hidebound, *Chirm* kh*úsbk.*
High-couraged, *Jan baz.*
Hill pony, *Tangbun.*
Hind-leg, *Paon.*

Hindquarters, *Putha*.
Hip, *Koola*.
Hobbles, casting, *Ghúr puchhur; lungur*.
,, (for the hind legs), *Míjuma*.
Hock, *Koonch*.
Hoe, *Phurwa*.
Hole (of stirrup leather), *Ghur*.
Hollow-backed horse, *Kuchhee*, or *zeen púsht ghora*.
Holsters, *Kuboor*.
Honey, *Shuhud*.
Hood (clothing), *Kunsilla*.
,, (of a carriage), *Bursatee*.
Hoof, *Súm*.
Hoof ointment, *Súm roghun*.
Horse, *Ghora*.
,, thin and useless (Rosinante,) *Dugga*.
with four white stockings and blaze, *Puchkuleeyan*.
,, to ("to come in season") *urm hojana ; híg lana ; ung hona*.
Horse-fly, *Dans*.
Hot, *Gurm*.
Hoven, *Badee*.
Hurdle, *Phoos kee tuttee*.

Indian hemp (dried flowers), *Ganja*.
,, ,, (leaves), *Bhung ; subzee*.
,, ,, (resin), *Churus*.
Indigestion, *Bud-huzmee*.
Inflammation, *Julun ; suzish*.
,, of the feet, *Súm ka tup*.
,, of the liver, *Kulíjí kee beemaree*.
Inflammation of the lungs, *Phephré kee beemaree*.
Intestines, *Ant*, *unturee*
Iron, sulphate of, *Huree kusees*.

Jade (horse), *khullur*.
Jaundice, *Yurkan ; kum wulbad*.
Jaw, *Juhra*.
Jib, to, Urh-*jana*.
Jockey, *Coachwan*.
Joint, *Jor*, *ganth*, *gira*.
Jump, to, *koodna ; phandna*.

Keeper (on reins), *Muchhlee*.
Kerosene oil, *Mittee ka tél*.
Kick, to, *Púshtuk marna ; lat chulana*.
,, (with both feet at once), *Dúluttee marna*.
Kicker, *Luttur*.
Kidney, *Gúrda*.
Knee, *Ghútna ; zanoo*.
Knife, *Chhúree*.

Lame, *Lungra*.
,, chronically, *Kuhna lung*.
Laminitis, *Súm ka tup*.
Lampas, *Talooa*.
Lard, *Soour kee churbee*.
Lead a horse, to, *Tihlana*.
Leading rein, *Bagdoree*.
Leather, *Chumra*.
Leech, *Jonk*.
Lime, *Choona*.
Linseed, *Ulsee ; teesee*.
,, oil, *Ulsee ka tél, or teesee ka tel*.
Lip, *Honth*.
Lip-strap, *Buhaddúree*.
Litter (manure), *Khad*.
Liver, *Kuléja*.
Livery stables, *Urgurra*.

Loins, *Kumr.*
,, paralysis of the, *Kumree.*
Loodianah fever, *Gutheea ; bhugona ; zuburbad.*
Lotion, *Doné kee duwa.*
Lukewarm, *Sheer gurm.*
Lunge a horse, to, *Kawa déna.*
Lungs, *Phéphra.*

Madness, *Deewangee.*
Maggots, *Keeré.*
Maize, *Mukaee.*
Mane, *Yal.*
Mange, *Khujlee ;* kh*arish.*
Mare, *Ghoree ; madwan.*
Mark in the teeth, *Dant kee seeahee.*
Martingale, *Zérbund.*
Matter (pus), *Peeb.*
Megrims, *Mirgee.*
Melanosis, *Bamunee.*
Membrane, *Jhillee.*
Mercury, *Para.*
Mill, hand, *Chukkee.*
Millet, *Bajra, ju'war.*
Moon-blindness, *Ruttowndhee ; shub-koree.*
Mount, to, *Suwar hona.*
Mouse-coloured (horse), *Soor.*
Mouth, *Moonh.*
Mucus (from the eyes), *Keechur.*
,, (,, ,, nose), *Néta ; ré*nt.
,, (,, ,, throat), *Khakhar.*
Muscle, *Gosht.*
Mustard, *Rai.*
,, oil, *Surson ka tél.*
Muzzle (of face), *Toothun.*
,, (,, wire, etc.), *Chheeka.*
Nail, *Prég ; mé*kh.
Nave (of a wheel), *Nabh.*
Navicular disease, *Sérum bad* (?).
Neatsfoot oil, *Paé ka tél.*
Neck, *Gurdun.*
Neigh, *Hinhinana.*
Nerve, *Usub.*
Nitre, *Shora.*
Nose, *Nak.*
Nose-bag, *Tobra.*
Nose-band, *Nasbund.*
Nostrils, *Nuthna.*
Nut (of a screw), D*ibree.*
Nux vomica, *Kuchla.*

Oakgalls, *Majoo.*
Oats, *Jy.*
Oil, *Tél.*
Ointment, *Murhum.*
Once round (racecourse), *Poora chukkur.*
One-eyed, *Kana.*
Ophthalmia, *Ankh u*th*na.*
Opium, *Afeem.*

Pad (harness), *Chal.*
Pain, *Durd.*
Palate, *Taloo.*
Pancreas, *Libba.*
Panel (of a saddle), *Guddee.*
Pant, to, *Hampna.*
Paraffin oil, *Mittee ka tél.*
Parrot-mouthed, *Toté duhun.*
Pastern, *Gamchee.*
Paw, to (from impatience), *Tapna*
,, (strike out with the fore-leg), *Tap marna.*
Pea, a, *Pisum sativum, mutur.*
Pepper, black, *Gol mirch.*
,, red, *Lal mirch.*
Periosteum, *Huddee kee jhillee.*
Pestle and mortar, *Hawun dista.*
Physic, *Duwa.*
,, to, *Duwa déna.*

Physic, to (purge), *Julab déna.*
Pick-axe, *Gyntee.*
Picker (hoof), *Súm-Khúdnee.*
Piebald, *Kala abluk.*
Pincers, *Zumboor ; sunrsee.*
Pinch (of salt, etc.), *Chútkee.*
Pleuro-pneumonia (cattle), *Pheepree.*
Plunge, to, *Lumbeean kurna.*
Pneumonia, *Phéphré kee beemaree.*
Pole (of a carriage), *Bum.*
Pony, *yaboo ;* tattoo.
Poppy heads, *Posta.*
Pores of the skin, *Musam.*
Port of a bit, *Jeebhee.*
Posts and rails, *Jungla.*
Pot (cooking), *Dégchee.*
Poultice, *Lúbdee.*
Powder (dry medicine), *Súfoof.*
,, (medicine wrapped up in paper), *Púreea.*
Prance, to, *Nachna.*
Proud flesh, *Bud gosht.*
Pulse (artery), *Nubz.*
Pumiced feet, *Chúpatee súm.*
Punch, *Súmba ; pogur.*
Pupil of the eye, *Ankh kee pútlee.*
Pus (matter), *Peeb.*

Quarter-ill (cattle), *Gutheea ; golee.*
Quiet (as a horse), *Ghúreeb.*

Race, *Bazee ; shurt.*
Racecourse, *Chukkur ; ghúrdowr.*
Racehorse, *Ghúrdowree ghora ; shurtee ghora.*
Rasp, *Rét.*
Rear, to, *Alif hona.*
Reins, *Ras.*
Removing (shoes), *Khol-bundee.*
Resin, *Ral.*
Retention of urine, *Péshab-bund.*
Rheumatism, *Baee.*
Ribs, *Puslee.*
Rice (cooked), *Bhat.*
,, (in husk), *Dhan.*
,, (uncooked), *Chawul.*
Rice-water, *Kanjee.*
Ride, *Suwaree kurna.*
Rig, a, *Ek andeea.*
Rinderpest, *Mata ; chéchuk ; devee.*
Ring (of martingale, etc.), *Chhula.*
Ring (of metal), *Kari.*
Ringbone (on fore-feet), *Chukrawul.*
,, (on hind-feet), *Pústuk.*
Ringworm, *Dad.*
Roan, *Gurra.*
Roar, to (disease), *Shérdumee kurna.*
Roaring, *Shérdumee.*
Rock salt, *Numuk sung.*
Roller (band) *Furakhee.*
Rope, *Russee.*
Rosette, *Kurn-phool.*
Rough-rider, *Chabúk suwar.*
Rowel, *Phirkee.*
Rubber (towel), *Jharun.*
Rump, *Pútha.*
Run away, to, *Bhag-jana.*

Saddle, *Zeen.*
,, to, *Zeen bandhna.*
Saddle-cloth,. *Tub-roo ; uruk-geer ; numda ; nyl* khora.
Saddle-covering, *Zeen-posh ; boghbund.*

Saddle-dressing, *Moomroghun.*
Saddle-flaps, *Dawun.*
Saddle-stand, *Ghoree*
Saddler, *Zeen saz ; zeen ka mochee.*
Sal ammoniac, *Nowsadur.*
Saliva, *Ral.*
Salt, *Numuk.*
Saltpetre, *Shora.*
Salts (Epsom), *Júlabee numuk.*
Sandcrack, *Shikak súm.*
Scales, *Turazoo.*
Scissors, *Kainchee.*
Scrotum, *Fota.*
Selling race, *Leelamee bazee.*
Sesamum oil, *Til ka tél, or jinjilee ka tél.*
Shaft (of a carriage), *Dunda.*
Shaft-tugs, *Choongee.*
Sheaf (of straw, etc.), *Poola.*
Sheath, Gh*ilaf.*
Shoe, *Nal.*
Shoeing, *Nal-bundee.*
Shoeing-smith, *Nal-bund.*
Shoe with calkins, *Khoonteedar nal.*
Shoe with clips, Th*okurdar nal.*
Shoulder, *Phur ; Kandhee.*
Shy, to, *Bhurukna.*
Sickle, *Durantee.*
Sieve, *Chhulnee.*
Sinew, *Py ; nuss ; pu*ttha.
Skeleton, Th*u*th*uree.*
Skewbald, *Lal abluk.*
Skin, *Chumra.*
Skittish, *Chunchul.*
Slight-built, Ch*huréra budun.*
Sling, *Jhola.*
Slow (as a horse), *Dheema ; mu*tha.
Snaffle, *Kuzaee.*
Snort, to, *Furfur kurna.*
Soap, *Sabun.*
Soap-nut, *Reeta.*
Sole of the foot, *Dilla ; tulwa.*
Sore back, *Pee*th, *lugna.*
,, mouth, *Buchka.*
,, throat, *Gulsooa.*
Sound (as a horse), *Béayh.*
Spavin, bog, *Motra.*
,, bone, *Hu*dd*a.*
Speck (in the eye), *Chheent.*
Spinal cord, *Huram mugh*z.
Spleen, *Tillee.*
Splint (bone), *Bél bu*ddee, *bér bu*ddee.
Splinter (of bone, etc.) *Kirich.*
Spoke of a wheel, D*uree.*
Sprain, *Moch.*
Sprain a tendon or ligament, to, *Py ajana.*
Spud (for rooting up grass), *Kúrpa.*
Spur, *Kanta múmréza*
Stable, *Istubbul ; than ; tubéla.*
Stack (of hay, etc.), *Gurree.*
Star on forehead, *Sitarapéshanee.*
Steeplechase, *Tuttee bazee.*
Stifle, *Kúlaba.*
Stirrup, *Rikab.*
Stirrup-leather, *Rikab duwal.*
Stirrup-lock, *Champ.*
Stomach, *K*otha.
Stomachic, *Pachuk.*
Strangles, *Húbuk.*
Strap, *Tusma.*
Straw, *Púwal.*
,, (a single), *Tinka.*
,, (for bedding), *Bichalee.*
Strawberry roan, with white legs and muzzle, and coat ticked out with white, *Cheena.*
Stringhalt, *Jhumuk-bad.*
Stripe down back, like that of a donkey, *Sélee.*

Stud-bred, a, *Lumburee ghota.*
Stumble, to, Th*okur khana.*
Sugar-cane, *Gunna ; ookh ; eekh*
Sugar of lead, *Suféda.*
Sulphate of copper, *Neela tootea.*
Sulphur, *Gunduk.*
Suppression of urine, *Píshab bund*
Sursingle, *Bala tung.*
Surfeit (skin disease), *Gurmee dané.*
Sweat, *Puseena.*
Sweat-scrapers, *Puseena-kush.*
Sweet oil, *Meetha tél.*
Swelling, *Wurum ; soojun.*
Synovia, *Jor ka tél.*

Tack (small nail), *Birinjee.*
Tail, *Dúm.*
Tan, *Bukla.*
Tape, *Feeta.*
Temple (of head), *Kun-puttee.*
Tendon, *Py ; nuss ; puttha.*
Tetanus, *Chandnee kee beemaree ; pista dubun.*
Thick (as gruel, etc.), *Gatha.*
Thigh, *Ran.*
Thorough-bred, *Useel.*
Thorough-pin, *Bhubbootura.*
Three-year-old, *Do-ek.*
Throat, *Gula.*
Throat-lash, *Gultunnee.*
Thrush (disease), *Russ.*
,, to have, *Russ siturna.*
Tire of a wheel, *Hal.*
Tired (fatigued), *Thuk gya.*
Toe of the foot, Th*okur ; pís* (more correctly, *písh.*)
Tongue, *Jeebh.*
Tongue of a buckle, *Buksooa kee soom.*

Tooth, *dant.*
,, milk, *Doodh ka dant.*
,, molar, *Darh.*
,, (nippers), *Dant.*
,, permanent, *Pukka dant ; pukka da*rh.
,, wolf's, *Chor dant.*
Tow, *Sun.*
Trace (harness), *Jot.*
Trace-bearer, *Manik jot.*
Trot, to, *Dúlkee chulna.*
Trough (feeding), *Kuthra.*
Trowel (for rooting up grass), *Kúrpa.*
Tumour, *Rusaowlee.*
Turpentine (crude), *Gunda biroza.*
,, (oil of), *Gunda birozé ka tél ; tarpeen ka tél.*
Tush, *Nísh ; koon*tee.
Twitch, *Kúchmal ; Poozmal.*
Two-year-old, *Nakund.*
Tympanitis, *Badee.*

Underbred, *Kumzat.*
Unsound, *Aybee.*
Unsoundness, *Ayb.*
Upright pasterns, *Mu*rgh-*pa.*
Urethra, *Nézé ka soorakh.*

Vagina, *Choot.*
Vein, *Rug ; wureed.*
Venice turpentine, *Gunda biroza*
Verdigris, *Jungal.*
Vertebra, *Munka.*
Veterinary manual, *Furus nama.*
Veterinary surgeon, *Saloturee sahib.*
Vicious (as a horse), *Badzat.*
Vinegar, *Sirka.*

Walk, to (as a horse), *Kudum kudum chulna.*
Walk a horse, to, *Rowl kurna.*
Wall, *Deewal.*
Wall of the hoof, *Shahk.*
Wall-eyed (one eye), *Takee*
„ (both eyes), *Súlymanee.*
Wart, *Mussa*
Water, *Panee.*
„ boiling, *Khowlta panee ; josh panee.*
Wax, *Moom.*
Weave, to (a stable trick) *Jhoomna.*
Weaver, *Jhoomnéwala.*
Weighing-room, *Tol ghur.*
Weight cloth, *Seesa-guddee.*
Wheat, *Géhoon.*
Wheel (of a carriage), *Puhiya.*
Whip, *Chabúk.*
White, with white mane and tail, and black skin, *Súrkha.*
White and pink skin, *Núkra.*
„ and dark mane and tail, *Subza.*
N.B.—*Sufêd* is the common word for " white."
Windgall, *Byza.*
Window, *Kirkee.*
Windpipe, *Hulk.*
Wind-sucker, *Howa peené wala.*
Winkers, *Putta.*
Winning-post, *Jeet kee lukree.*
Wisp, *Koocha.*
Withers, *Mudow.*
Womb, *Kokh.*
Worm in the eye, *Moonja.*
Worms (round), *Kénchooa.*
„ (thread), *Chúnchúna.*
Wound, (*Zukhm*).

Yard, *Néza.*
Yearling, *Surloo.*

Zinc, sulphate of, *Suféd Tooteea*

IDIOMS AND PHRASES

The *abscess* has come to a head	*Phora puk gya.*
The horse has a sore *back*	*Ghoré* kee peeth *lugee hy.*
My horse is *blown*	*Hamaré ghoré ka dum phool gya hai.*
The horse *bolted* off the course	*Ghora chukkur sé phut gya.*
My horse *bores* to the right	*Humara ghora dahiné ko bag kurta.*
Where was that horse *bred?*	*Wuh kis khét ka ghora hy?*
The horse is not properly *broken* in	*Ghoré ka mooh kuchcha hy.*
The horse has cut himself *brushing*	*Ghoré ko néwur luga hy.*
The horse has a *cataract* in his off eye	*Ghoré kee dahinee ankh mén moteea-bind hy.*
The horse is in hard *condition*	*Ghora ka budum* gutheela *hy.*
The horse is a *crib-biter* (or *wind*-sucker)	*Ghora howa peeta.*
Wash the horse's *dock* and sheath	*Ghoré kee saghiree aur fota dho.*
The horse looks *dull*	*Ghora sust maloom déta hy.*
He *fell* off the horse	*Wuh ghoré pur sé gira.*
The horse's leg is *filled*	*Ghoré ko py agyee.*
Put the shoe *firmly* on	*Nal jikkur ké bandho.*
The mare is in *foal*	*Ghoree gabhin hy.*
Foment the horse's leg with hot water for half an hour	*Ghore ké pyr ko gurm panee se adhé ghunté tuk sénko.*
Slacken the *girths*	*Tung* dheelé, *kuro.*
Tighten the *girths*	*Tung kuso.*
Give your horse two or three *go-downs* of water	*Apné ghoré ko do teen ghoont panee do.*
The horse chucks his *head* (when being ridden)	*Ghora sir marta.*

The horse has cracked *heels*	*Ghoré kee gamchee mén chheewur ho gya.*
He *hogged* the mane of his pony	*Usné apné* tattoo *kee yal ko hubree keeya.*
Hold my horse	*Humara ghora thamo.*
The jockey was not able to *hold* the horse	*Coachwan ghore ko nuheen rok sukka.*
Lengthen the stirrups one *hole*	R*ikab ko ékghur aur lumba kuro*
Shorten the stirrups two *holes*	*Rikab ko do ghur chuthao.*
The horse's *hoof* slopes too much ; take more off the toes	*Ghoré ka súm zeeada sulamee hy, punjé ké neeché sé aur cheelo.*
The horse has *hurt* his leg	*Ghoré ké pyr ko chot lugee.*
Don't *jerk* the reins	R*as ko jhutka mut do.*
The horse has clean *legs*	*Ghoré ké hath pyr durust hy*n.
The horse has got *lockjaw*	*Ghoré ko chandné né mara.*
Make much of your horse	*Apné ghoré ko dilasa do.*
He can't *master* the horse	*Ghora is sé nuheen dubta.*
That horse is difficult to *mount*	*Wuh ghora bud rikab hy.*
The mare has a light *mouth*	*Madwan ka moonh nurm hy.*
How *old* is that horse ?	*Us ghoré kee úmr kya hy ?*
The horse has *ophthalmia*	*Ghoré kee ankh ú*th*ee.*
Tell me the good and bad *points* of that horse	*Us ghoré ké ayb aur húnur hum sé kuho.*
The horse *pulls* a great deal	*Ghora buhút moonh zor hy.*
The grey horse *refused* the water-jump	*Subza ghora nalé sé phut gya.*
Your horse is a *roarer*	*Túmhara ghora shérdumee kurta.*
He has a strong *seat*	*Uska asun kura hy.*
He has a weak *seat*	*Uska asun* dh*eela hy.*
Ride the horse at a *smart* walk	*Ghoré ko chutuk sé kudum kudum chullao.*
Take the horse once round at *half speed*	*Ghoré ko ék chukkur a*th *anné ka do.*
The horse has *sprained* his leg	*Ghoré ké pyr men moch aya.*
I will give the horse a *sweat* to-morrow morning	*Hum kul fujjur ghoré sé pusseena nikaléngé.*
The horse goes *tender* on the near fore-leg	*Ghora apné bayan hath ko kuchh manta hy.*
The horse has *thrush*	*Ghoré ké súm mén rus útura hy.*

Don't put on the bandages too *tight*	*Puttee zeeada tung mut bandho.*
The horse *trips*	*Ghora thokur khata.*
The horse *turns out* his toes	*Ghoré ké pyr mén tao hy.*
The horse is a *weaver*	*Ghora humésha jhoomta.*
The horse's *wind* is good	*Ghoré ka dum* khoob *achcha hy.*
The horse's *wind* is bad	*Ghoré ka dum juldee* toot *jata.*
Wisp down the horse	*Ghoré ké kooncha maro.*
The horse's *withers* are galled	*Ghoré ka mudow sooja hy.*

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